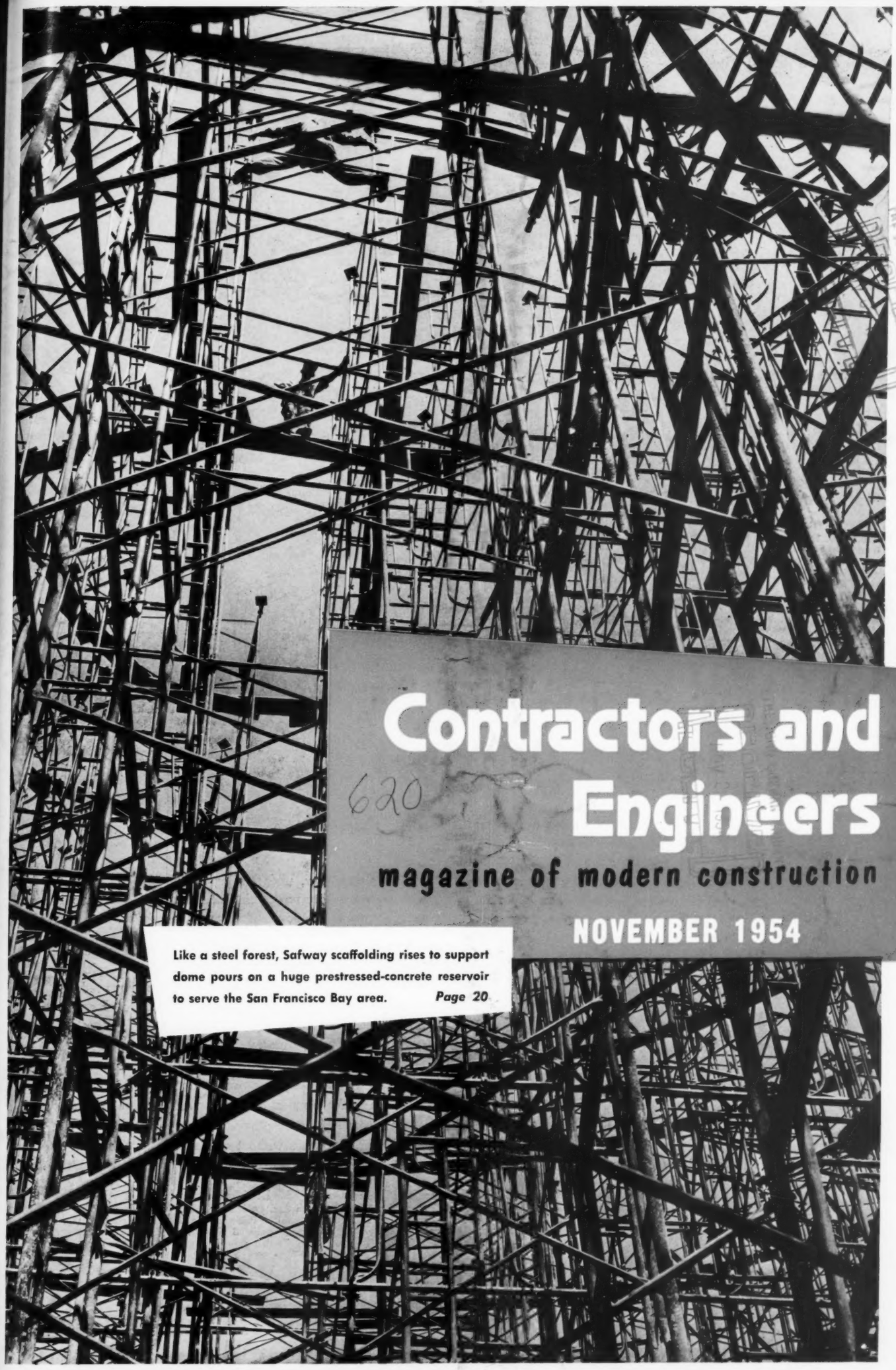

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Contractors and Engineers

magazine of modern construction

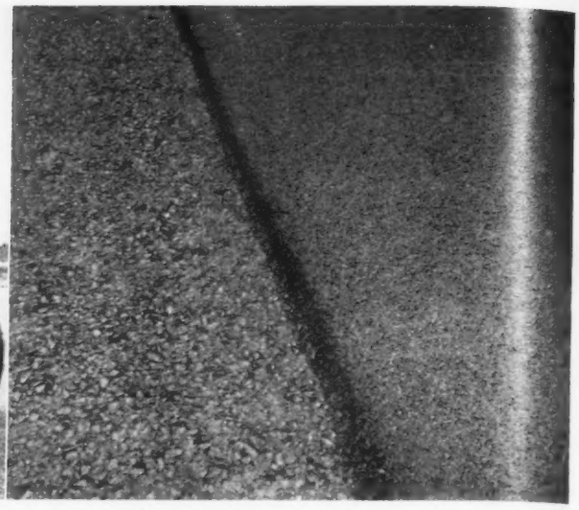
NOVEMBER 1954

620

Like a steel forest, Safway scaffolding rises to support dome pours on a huge prestressed-concrete reservoir to serve the San Francisco Bay area. *Page 20*

(upper left) Laying Hot-mix Asphaltic Concrete over old rigid pavement on Delaware State Route 18.

(upper right) Close-up showing the two courses of Texaco Asphaltic Concrete used on Delaware resurfacing project.



(lower left) Traffic used the State Highway without interruption while new surface was under construction.

(lower right) Section of completed pavement before shoulders received three applications of Texaco Cutback Asphalt.

Delaware's answer to:

"What thickness of Asphalt is needed when resurfacing old concrete highways ?"

CONTRACTOR
Nello L. Teer Co., Durham, N. C.

When an existing highway of the rigid type is to be resurfaced with hot-mix asphaltic concrete, an important question calling for a decision by the engineer concerns the thickness of the new asphalt surface.

Pictured here is a recent resurfacing project of the Delaware State Highway Department, located on its Route 18. The new Texaco Asphaltic Concrete pavement constructed on this highway was laid in two courses having a combined thickness of 3-¾ inches.

Sound engineering practice dictates that when a new asphalt wearing surface is laid over an old rigid pavement, it should have a minimum thickness after compaction of 2½ inches to deliver lasting service with lowest upkeep. The thickness to be specified for a particular project must be based on an accurate knowledge of the volume and weight of traffic to be served.

Where necessary, undersealing of the old pavement with asphalt before resurfacing will greatly enhance the performance of the new asphalt wearing surface.

Whatever your street, highway or airport paving problem, there is a Texaco Asphalt Cement, Cutback Asphalt or Slow-curing Asphaltic Oil exactly suited to your needs. These products are used in the construction of Plant-mixed and Penetration Macadam pavements for heavy traffic; low-cost, intermediate-type asphalt surfaces for secondary roads and streets; as well as inexpensive surface-treatments. Helpful information regarding materials and methods recommended for all types of Texaco asphalt construction is provided in two free booklets, which you can obtain without obligation by writing our nearest office.

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TEXACO
REG. T. M.

TEXACO ASPHALT

Contractors and Engineers
magazine of modern construction

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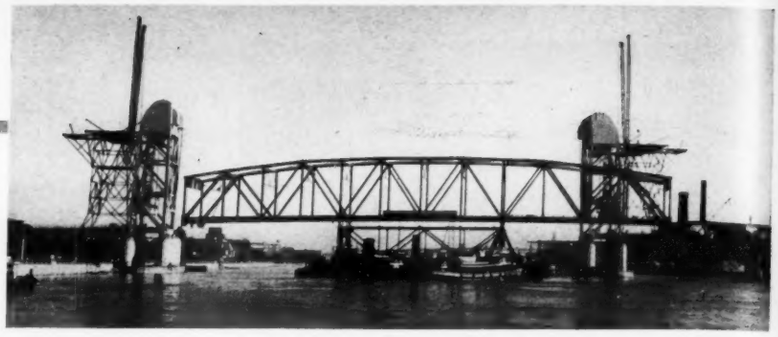
EDITORIAL



Spans and the Grand Plan

In this issue we are carrying two reports on one of the more spectacular phases of bridge construction—the floating-into-place of giant pre-assembled truss spans. The picture above shows a 1,000-ton 420-foot lift span about to be positioned for the new Queens-Welfare Island Bridge over the East River in New York City (see page 38). Since September, motor traffic along Florida's west coast has been using the 15-mile Sunshine Skyway as it crosses Tampa Bay on a causeway of bridges and hydraulic fill. Big steel trusses for the main span were likewise floated into place on that job, as shown in the illustrations on page 52.

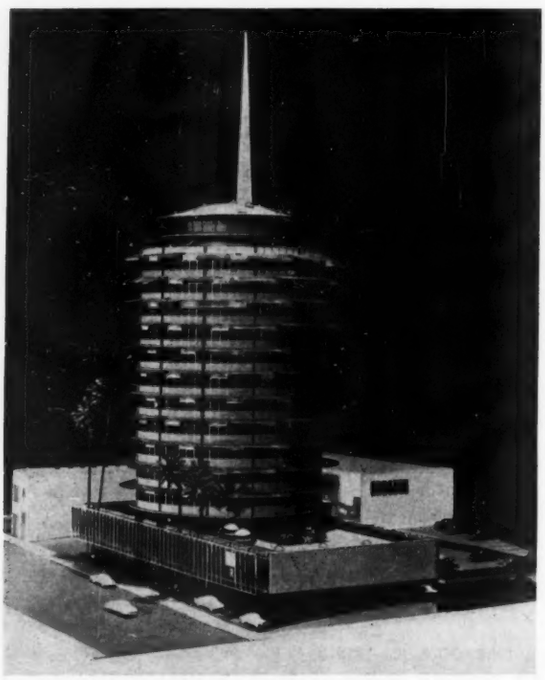
These splendid structures, albeit expensive, are just a couple of links over water in the general pattern of motor transportation in this country. There are many others under way or being completed, such as the Richmond-San Rafael bridge in California and the Mackinac Straits span in Michigan. They will all help to speed vehicular traffic over our great arteries of travel, and resulting economic benefits such as the elimination of congestion, saving of time, and opening up of undeveloped areas will more than compensate for their cost. President Eisenhower's multibillion-dollar highway modernization program will necessarily include many new bridges, both large and small.

This "grand plan" has now gotten out of the nebulous stage and into the more practical phase of financing $100 billion worth of highway improvements over the next ten years. The committee the President set up for this purpose, headed by Gen. Lucius D. Clay, is considering establishing a special lending agency somewhat similar to the old Reconstruction Finance Corporation. Such an agency could lend funds to states to assist them in carrying out their long-range highway-construction programs. And there are many states that need such help to get their roads built.

The American Association of State Highway Officials suggests that the federal government itself pay for the modernization of the interstate highway system, and that the states be responsible for the maintenance. Nearly one-quarter of the $100 billion total highway program, or $24 billion, would be required to remodel the interstate system over the next ten years, the AASHO believes. Building such roads through urban areas is particularly costly.

Opposition to the plan has been voiced, chiefly because of the cost. But the country cannot obtain these badly needed highways without funds, either directly from taxes or indirectly from some form of banking program. Whatever has been spent on road building has been well repaid by better transportation and communication in the advancement of our economy. Now is not the time to sell road construction short.

NEWS AND VIEWS



A model of a unique office building being put up for Capitol Records, Inc., in Hollywood, Calif. Believed to be the world's first round office building, the structure will consist of a 12-story reinforced-concrete cylinder above a rectangular one-story base.

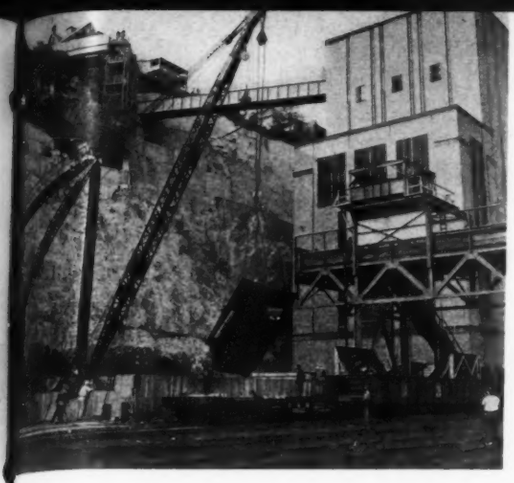
It looks as though 1954, proving the forecasters wrong, will become the ninth consecutive year in which a new record is made for construction put in place. And private and governmental organizations gaging the level of construction activity for 1955 are, in contrast to last year, decidedly optimistic. All agree that next year's building expenditures should be higher than the $52 billion expected to be spent in 1954. Most of this year's work—topping 1953's record of $50 billion by a three or four per cent margin—is in new construction.

The current volume of construction should continue for at least the next six months, according to a survey conducted among 124 chapters of the Associated General Contractors of America, with highway work holding the spotlight. This survey, covering 6,500 firms doing more than 80 per cent of contract operations, also makes a regional listing of job prospects.

New England should lead the pack, with work expected to move to a higher level in factory, school, and hospital construction particularly. For the Middle Atlantic, Rocky Mountain, and Southwest states, work should remain at the current level, though in some localities it is expected to increase. The outlook for the midwest is good, particularly in highway and toll-road work. The far west can anticipate a rise in most categories of work, as can the south, where population increase and the location of new industries should spur work.

The shift of families to the suburbs and the subsequent need for new transportation facilities, shopping centers, schools, and the like is echoed in the forecast made by the U. S. Chamber of Commerce. This body also points to the volume of work now being done by architects as a further support for the good construction outlook in 1955. In general, private authorities are in agreement with the Chamber of Commerce and with the findings of the AGC.

Aside from volume of work, the AGC feels that material prices and wages will remain stable in the new year. It warns, though, that competition is expected to become even more intense. Lay the cause for this on the ability of well-equipped contractors to do more work, the increasing number of companies in the field, contractors going out-of-state for jobs, and the favorable weather this past season which permitted many to finish work ahead of time and seek other contracts.



A section of the shield which will drive the third tube of the Lincoln Tunnel under the Hudson River is lifted off a flat-bed freight car by a derrick. This first section of the shield weighs 22 tons.

C&E Staff Photos

Workmen guide the segment to the concrete cradle at the base of the shaft. Cutting edges around the rim of the shield will cut through the silt of the river bottom as the shield is propelled forward.

All-Welded Shield Drives New Lincoln Tunnel Tube from New Jersey to New York

A 240-TON SHIELD—having an all-welded steel shell and internal structure—last month started boring under the Hudson River to drive the third tube of the Lincoln Tunnel 5,486 feet from New Jersey to New York.

Just a little more than a month previous, the joint venture contractors on the under-river work, Mason & Hanger Co., Inc., The Arthur A. Johnson Corp., and MacLean-Grove Co., Inc., all of New York, N. Y., assembled the shield in the 55-foot-deep ventilation shaft gouged out at the base of King's Bluff in Weehawken, N. J. The all-welded shield, considered stronger than conventional riveted shields, was built for the Port of New York Authority by the American Locomotive Co., Schenectady, N. Y., at a cost of $232,767, and delivered by rail to the New Jersey shaft in 9 sections. (See "Lincoln Tunnel Shield is Poised for Big Push", C&E, May, 1954, pg. 100.)

The first segment to be set weighed 22 tons. A derrick lifted the section from a flat-bed freight car on the rail siding adjacent to the shaft, then lowered it slowly to a heavily timbered cradle at the base of the shaft. Each of the other sections was lowered in the same way, and welded together at the tunnel portal.

A total of 28 jacks, each capable of a 200-ton thrust, were later set in place in the shield. These jacks move the shield forward on a concrete runway, 32 inches at a time, as cutting edges around the circumference of the shield slice through the underwater mud and silt.

The completed shield, cylindrical in shape, measures 31 feet 8 inches in diameter and 18 feet 4 inches in length. It made its initial push braced against a 30-inch-thick concrete wall constructed at the base of the shaft. As a push is made, an erector arm attached to a diaphragm at the rear of the shield places a 3,200-pound cast-steel ring inside the tail to form a permanent lining for the tunnel. The hydraulic jacks then brace against this newest ring to make another 32-inch shove.

About 90 per cent of the material displaced by the tunnel is being pushed to one side. The remaining material is being brought into the tube through openings in the shield and used on the floor as ballast. This tends to offset the effect of compressed air in the tunnel, so that the tube remains stable in the soft silt of the riverbed. THE END

THEY TOOK A TIP FROM THE FORTY-NINERS at Cherry Valley Dam, now rising in California's Sierras — for much of the overburden clung to slopes too steep for equipment. So they washed it down into the valley with high-pressure water jets, which also were used to wash out fines (as shown above). Then crawlers and the following rubber-tired equipment took over—15 scrapers, 35 haulers, 3 water trucks, 3 compactors, 14 pickups, 2 grease trucks, 3 flat-bed trailers and a couple of tank trucks. The mountain goats would hardly know the old place now!

BIG TIRE STOCK PILE ON JOB speeds changes for inspection and maintenance.

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Trucks get regular servicing as well as repairs at this truck-service setup. The Freuhauf trailer carries a complete supply of parts for the International trucks on the job. The 4-inch concrete slab on which the truck is parked is 16 × 32 feet.

C&E Staff Photos

This job-fabricated "front porch" gives the mechanic quick and easy access to the engine of the big International truck. Made of a few pieces of steel, the device hooks over the front tire and can be attached or removed in a few seconds.

A complete inventory of parts for various models of International trucks is maintained in the truck-service trailer, which also contains a work bench, machines, and hand tools. Here Carl Shope, truck mechanic, operates the valve refacer.

Complete Service Setup Maintains Paving Spread

Daily check of trucks and heavy equipment at job site keeps machines at top efficiency, prevents breakdowns

By RALPH MONSON, Field Editor

WHEN KOSS CONSTRUCTION CO., Des Moines, Iowa, set up job headquarters near Festus, Mo., for the paving of U. S. 67, the big Freuhauf trailers which house the truck service and heavy equipment service sections were assigned choice locations on the lot. The colorful red trailers with their silver roofs were loaded with supplies, parts, tools, and equipment to keep the concrete-paving spread operating at full capacity throughout the season.

On this paving job, delays caused by breakdown are rare and of short duration. The company's policy of replacing worn equipment with new before the breakdown stage is reached has much to do with this operating efficiency. The annual overhaul and repair program carried on at established "winter quarters" is also a factor. But the daily routine maintenance program carried on right on the job is the main factor. This preventive maintenance program is aimed at anticipating breakdowns and seeing they do not occur. Of course, the crews are also fully equipped to make rapid emergency repairs when necessary.

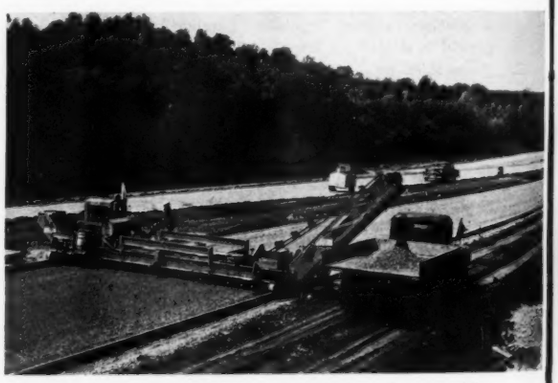
On this job, one of the big trailers was stocked with a complete supply of parts for each of the several models of International trucks on the job. With the exception of a few rentals, all trucks on the job were Internationals. A second trailer carried an assortment of parts for the heavy equipment, and a third was loaded with tires, lubricants, and bulky parts. These trailers also carried a complete line of tools and equipment needed for servicing and maintaining the rigs. Competent and well-trained crews provided the manpower to round out the maintenance sections.

Careful Planning

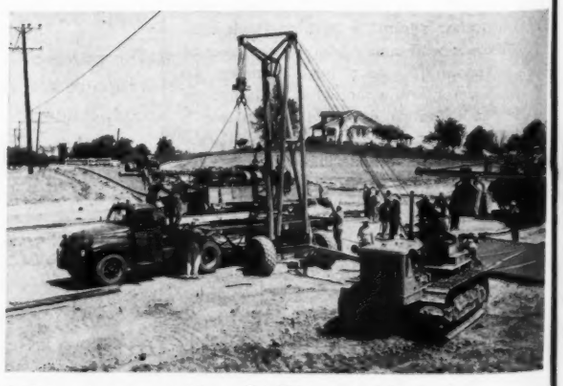
Equipment maintenance, like all other phases of this job, was carefully planned. The truck-service trailer was spotted at one side of the lot near the entrance from the haul road. It was a convenient spot for trucks to stop for even the smallest adjustment or minor servicing. The gasoline supply pump was located conveniently nearby. One of the first operations was to place a concrete slab, on which the mechanics could work, in front of the service trailer. This slab was 16 feet wide, 32 feet long, and 4 inches thick, and was finished smooth to facilitate the use of creepers under the trucks.

Differential and transmission

The service truck lubricating this Cat No. 12 motor grader carries greases (dispensed by an Alemite system) and oils, an air compressor, and a Jackson generator for night lighting. The Graco pump on the barrel pumps semifluid joint compound.



Because the rock base material is too valuable to be wasted by simply being dumped on the shoulders, the excess material is dumped into trucks and saved for use elsewhere. The elevator on this Buckeye subgrader was rebuilt for the purpose.



A Tournacrane operated by a Cat D7 tractor picks the Jaeger finisher off the forms and loads it on an International truck with Freuhauf trailer. The equipment will be hauled to the start of the next section. Two Tournacranes were on hand for this work.

A. M. Beuerlein, general superintendent for Koss, checks over the day's reports in his Anderson trailer office. The contractor paved eight miles of concrete pavement, 24 feet wide and 8 inches thick, in less than two months.

C&E Staff Photo

grease and chassis lubricant were dispensed by an Alemite system, for which air was supplied by a Curtis compressor inside the trailer. Motor oil was pumped from barrels with a hand pump. Trucks were lubricated every other day when operating in dusty conditions, and about every third day when operating on pavement or over relatively dust-free roads. Truck mechanic Carl Shope and his helper made a daily check of every truck in the spread. They checked oil in engines and hoists, examined fan belts, looked for broken spring leaves or other broken or damaged parts, and generally kept the trucks in tune.

Complete assemblies such as engine heads, rear ends, and clutches, were kept on hand for each model of truck, so the entire assembly could be changed instead of taking out and replacing individual parts. If something went wrong with a rear end, the crew could have a new one installed in 45 minutes. Clutches could be replaced in an hour and a half. Changing heads took about the same length of time. Tires were changed in as little as 3 minutes. With that kind of service, it was seldom that any of the 28 trucks were laid up long for repairs.

Servicing Heavy Equipment

Since much of the paving equipment remained at the actual construction site, the heavy-equipment service crew spent most of its time right out on the work. Every piece of equipment was serviced each day from a truck carrying an Alemite lube system, an air compressor, and a Jackson generator for night lighting. Machines which could be stopped during the day without interrupting the work sequence were greased whenever they could be reached. Others, like the pavers, were checked and lubricated each evening after regular working hours. Sinclair fuel and lubricants were used exclusively on this job.

Back at the job headquarters, one of the big red trailers carried a carefully selected assortment of parts for the paving equipment. Hobart and Westinghouse arc-welding machines and acetylene welding and burning equipment were stored nearby. A big, wheel-mounted, CO_2 fire extinguisher stood beside the trailer, ready for use in an emergency. A similar extinguisher stood beside the gas pump where the trucks were fueled. The heavy-equipment mechanic, I. G. Ness, and his crew kept a watchful eye on the paving equipment at all times. They not only made such repairs as were necessary, but they used their ingenuity to remodel machines or add gadgets to increase production.

Winter Quarters

At the close of each construction season, all of the equipment is taken to winter quarters for overhauling. Truck wheels are packed, brakes relined, transmission and differentials drained and refilled, and each truck is given such overhauling as is considered necessary. About every second year they are repainted and a new Koss decal is applied to the door.

Other equipment is overhauled

(Continued on next page)

New kind of tractor

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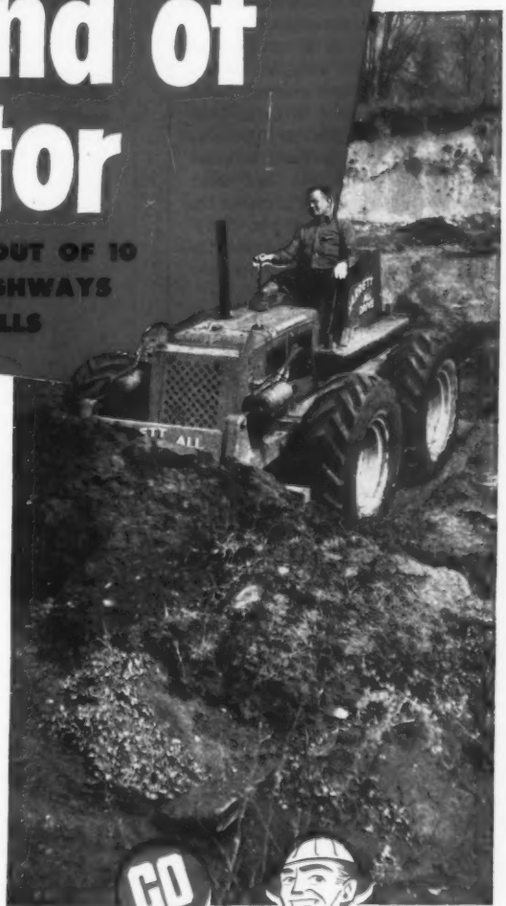

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(Continued from preceding page)
and reconditioned as is needed to put it in first-class shape for the coming construction season. Many of the employees are kept on the year-round payroll by virtue of this winter overhaul program. With the winter quarters for this crew permanently located at Springfield, Mo., the men and their families can establish permanent homes and enjoy community life to a greater degree than is usually possible for construction workers.

This year, the construction season started at Festus with paving operations beginning April 1. The 8 miles of 8-inch concrete pavement 24 feet wide—paved the entire width at one time—was completed May 27, and the crew moved immediately to another location. This divided-highway job was a joint venture of Koss Construction Co. and Porter-DeWitt Construction Co., Poplar Bluff, Mo. Porter-DeWitt did the grading, 4-inch compacted crushed-rock base, and shouldering. Koss laid the concrete paving.

The Koss paving train included 8,000 linear feet of 8-inch Blaw-Knox paving forms. A Schramm air compressor mounted on a Willys Jeep and powered by the Jeep engine furnished air to a Boyer riveting hammer which was used to drive form stakes. This crew preferred the relatively light Boyer hammer to other stake-driving tools they had tried. A Cleveland Formgrader prepared the grade for the forms and two Cleveland form tampers compacted the material under the forms after they were set.

An example of the ingenuity of the workmen is found in the remodeled Buckeye subgrader. On this job the rock base material was too valuable to be wasted by simply dumping it on the shoulder, so the workmen rebuilt the elevator on the subgrader so that it would load the excess material into a truck. Excess base material was thus saved and placed where it was needed. An 8-ton Huber tandem roller followed the subgrader, after which a Cleveland pull planer pulled by an Oliver wheel tractor struck off the finished grade.

Two Koehring 34-E Twinbatch pavers operated from the roadway shoulders outside the forms, depositing a relatively stiff concrete mix on the roadbed ahead of a Jaeger spreader and a Jaeger finishing machine. Three Jackson Vibro-Spades were attached to the rear of the spreader to help consolidate the concrete adjacent to the side forms and around the center joint former. These vibrators could be readily removed and used by hand at any point near the spreader. A Jackson vibratory tube was carried on the front edge of the finishing machine to complete the compaction. Separate Jackson generators on the spreader and the finisher provided power for operation of the vibrators.

Water for the pavers was supplied by six International trucks with 1,000-gallon tanks. These trucks backed over the shoulder to the pavers. When they were coupled up to the paver, a cable was attached from the paver to the truck so that the paver pulled the truck backward as it moved, thus avoiding strain or damage to the connecting hose.

The balance of the paving train consisted of a Flex-Plane joint machine, a Koehring longitudinal float, and a hand burlap drag. Hunt Process curing compound was applied immediately after the finishing with two hand-held sprays, each consisting of a long pipe with two spray nozzles. Another original gadget was an attachment, for the blade of a D4 Caterpillar dozer, for pulling form stakes. The hoist, which was used to pick up the forms and load them on the truck, was also a product of the company's shop.

When the paving train reached the end of a run and had to be moved to a new location, two Tournacranes powered by Caterpillar D7 tractors were put to work. One of these rigs picked the machines off the forms as they reached the end of the run and loaded them on a waiting flat-bed trailer. The trailer carried the machine to the new location, where the other crane set it back on the forms. This transfer could be made at least as fast as the pavers could be walked to the new location.

At the batch plant, aggregates were weighed from two Johnson 55-yard bins equipped with double weigh-batchers. The sand bin was charged by a Northwest 6 crane using a 1¾-yard Johnson clamshell bucket. A Koehring 605 crane with a 2-yard Johnson clamshell supplied the two sizes of coarse aggregate. Cement was batched from a 100-barrel Johnson Dutch Mill plant equipped with a twin batcher to load both compartments of the batch trucks at once. All batch trucks were fitted with tight covers to prevent loss of cement in transit.

Typical of the thorough planning on this job was the special railroad spur which was run into the batch plant. The contractor constructed the grade for the spur and the Missouri and Illinois Railroad laid the ties and rails. At the conclusion of the job, the rails and ties were removed by the railroad. Building the spur to fit the job meant that the bins and stockpiles of the batching plant could be located just as the contractor wanted them.

Personnel

Occupying a prominent place in the headquarters area were the two office trailers housing the superintendent's office and job accounting section. The latter was housed in a big Freuhauf trailer which was air-conditioned. This not only provided comfortable conditions for the staff, but eliminated much of the dust which would be damaging to type-

writers, calculating machines, and other office equipment. Payrolls, cost accounts, and all routine job business was conducted through the field office, leaving a minimum of details for the home office.

Project superintendent A. M. Beuerlein had his office in an Anderson trailer fitted especially for office use. Like the other equipment, this trailer was painted a gleaming red. Assisting with the job supervision were Lawrence Beuerlein, superintendent of paving, and Glenn Ryan, superintendent of grading.

Resident engineer for the state of Missouri was Leo Wommack. The project was under supervision of the Kirkwood District of the Missouri State Highway Department, of which R. W. Hodson is district engineer. Rex M. Whitton is chief engineer of the department. THE END

Yuba Resumes Manufacture Of Hydraulic Dredges

Resuming the manufacture of hydraulic dredges, the Yuba Mfg. Co., San Francisco, Calif., has started to build dredges from 6 inches up for use in harbor construction, channel excavation, levee construction, hydraulic fills, and the production of sand and gravel. The company has manufactured bucket ladder dredges for almost 50 years.

George Pelton, who has specialized in hydraulic dredging for a number of years, will be responsible for the hydraulic dredging program. He was formerly associated with Standard Dredging Co. of New York, N. Y., and Los Angeles, Calif., for more than 24 years. He has also served as a consultant on important overseas projects.

This 4½-yard unit is the third model to be introduced in the Blaw-Knox Series M mixers. These mixer-agitators are designed to carry as large a payload as possible on a short wheelbase.

Truck Mixer Designed For Short Wheelbase

■ Blaw-Knox has added a new truck mixer to its Series M—a 4½-cubic-yard capacity unit. The new mixer joins the 5½ and 6½-cubic-yard models previously announced. The manufacturer describes these units as compact yet accessible mixer-agitators that give users the maximum payload at minimum weight on the shortest possible wheelbase.

Model M Hi-Boy mixers can be furnished with either an open or closed-end drum. A stationary charging hopper fits into a large-diameter charging cone in the drum opening, which rotates with the drum. The charging cone eliminates spilling of materials during the charging operation and permits fast loading at a rate of 8 to 9 seconds per yard. It also materially increases the water-level capacity of the drum.

Wear-resistant Manten steel is used for the mixer shell and blades, with thicker plates in the front sections of the drum where the greatest wear occurs. Spillage of concrete on steep grades is prevented by a drip shield on the charging hopper, as the spiral blades dam the opening between the charging cone and the drum shell. The distributing chute, also of Manten steel, is made in two pieces and has a total length of 10 feet.

For further information write to the Blaw-Knox Co., Blaw-Knox Equipment Div., Pittsburgh 38, Pa., or use the Request Card at page 18. Circle No. 605.

Catalog and Parts List Of Tubular Scaffolding

■ A catalog of the various parts used in the erection of Advance tubular-steel scaffolding and material-hoisting towers is available on request. Sections are devoted to panels available, as well as to locking devices, panel braces, and scaffold accessories.

Typical assemblies illustrated include a rolling tower, a running scaffold, a hoisting tower, and Flex-Ti scaffold assemblies, which are combinations of interchangeable tubular members and clamps adaptable to irregular shapes.

To obtain this literature write to the Beaver Art Metal Corp., Box 792, Ellwood City, Pa., or use the Request Card at page 18. Circle No. 671.

W MAINTENANCE COSTS

Reports Isbell Construction Company, Reno, Nevada

"WITH TEXACO MARFAK," reports the Isbell Construction Company, "we've enjoyed over 15 years of low maintenance costs and extra long chassis parts life. Our experience has shown that no matter how tough the terrain, *Texaco Marfak* stays in the bearings and really gives them protection against dirt and moisture."

Contractors everywhere get similar results with *Texaco Marfak*. It won't squeeze or jar out, stays in the bearings, effectively guards against wear and rust. It's top assurance of lower maintenance costs, longer bearing life.

In wheel bearings, use *Texaco Marfak Heavy Duty*. Isbell does and finds that it safeguards bearings for extra thousands of miles between repackings, increases bearing life, assures greater braking safety. No seasonal change required.

More than 500 million pounds of Texaco Marfak have been sold

For crawler tracks, *Texaco Track Roll Lubricant* is ideal. It wards off rust and wear—keeps out dirt and moisture.

Let a Texaco Lubrication Engineer help you step up your equipment efficiency, cut down on maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO SIMPLIFIED LUBRICATION PLAN

With *not more than six* Texaco Lubricants you can handle *all* your major lubrication. The plan saves time and money, reduces lubricant inventories, eliminates lubrication mistakes. Ask a Texaco Lubrication Engineer all about it.

To keep its equipment on the job, and maintenance costs low, Isbell Construction Company—highway builder, open pit mining contractor—has been using Texaco Products for years.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Latest Equipment Speeds Pile Driving

Two crawler rigs mounting new steam generators drive timber piles at the rate of two hundred a day

With the 50-foot boom and 40-foot leads in a fixed position, this drop-hammer-type jetting device, consisting of a railroad rail with a 2-inch pipe strapped to each side, rides up and down the side of the leads to jet a hole for the pile.
C&E Staff Photos

BY USING some of the latest ideas in pile driving, the contractor on the new Miami sewage-treatment plant developed two highly efficient rigs that are now driving timber piles at the combined rate of 200 per 8-hour day. The job requires a total of 11,000 piles driven through about 14 feet of sand and 6 feet of coral rock.

Paul Smith Construction Co., Miami, contractor on the $9,200,000 job, has two Northwest No. 6 crawler rigs equipped with several new devices for speeding both jetting and driving. Smith's plan consists of jetting a hole in the sand, inserting the pile, and then driving it through the rock. His procedure requires several operations, but he has developed self-contained rigs that handle the job quickly and efficiently.

Because most of the piles are the same length and are driven plumb, the 50-foot booms and the 40-foot leads on the Northwest rigs are fixed in the driving position. This has the additional advantage of releasing the boom-raising drum for other services.

Jetting is done by a drop-hammer-type device that travels in guides up and down one side of the leads. This device consists of a standard railroad rail with a 2-inch jet pipe strapped to each side of the web. The rail extends about 6 inches beyond the nozzles of the pipes for protection.

The procedure is fast and simple. After the device is maneuvered over the pile position by the rig, it is worked up and down in the sand as the high-pressure jets remove the material. As the hole is made, a pile is swung into the leads. When the jetting is completed, the crawler rig revolves slightly to the right, bring-

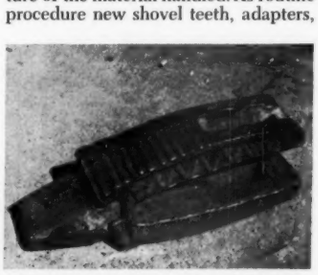
This 5 yard Manitowoc shovel is amply protected at all wear points with Stoody 21.

STOODY 21 helps maintain schedule on Nevada's Highway 40

Stoody 21 has played a part in meeting earth-moving schedules for Morrison-Knudsen, world's largest construction company, on a 2½ million dollar grading job, expanding Nevada's Highway 40 between Reno and Fernley. Contracting to do the job in 170 days, M-K has kept well ahead of schedule.

Equipment used by this division of M-K is customarily hard-faced before it goes into service. On the Nevada highway job this protection was doubly important because of the abrasive nature of the material handled. As routine procedure new shovel teeth, adapters,

Worn teeth built up with grader blade scraps and hard-faced with Stoody 21.



All exposed areas of this shovel tooth adapter are hard-faced with Stoody 21.

buckets and ripper teeth were hard-faced with Stoody 21 and maintained with this alloy throughout. Worn teeth were built up by welding a section of grader blade to the point, using low hydrogen electrodes. These teeth were then hard-faced as illustrated. No pre-heat or heat treatment was used, nor was any effort made to follow a particular hard-facing pattern—the object was simply to get on enough hard metal to do the job.

Because of Stoody 21's resistance to both abrasive wear and impact, average shovel tooth life on this job was extended to two full shifts before rebuilding or refacing became necessary.

Stoody's hard-facing experience in protecting equipment over the past quarter century is yours for the asking. See your Stoody dealer (consult the yellow pages of your phone directory) and request a free copy of the "Hard-Facing Guidebook," or write direct.

STOODY COMPANY
11936 E. Slauson Avenue,
Whittier, California

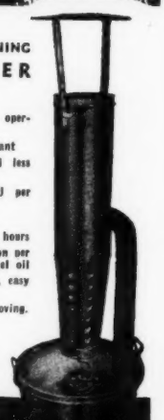
BEST BUY... PORTABLE HEAT

HY-LO OIL BURNING
SALAMANDER

Featuring

- Low first cost and low operating cost
- Requires no skilled attendant
- Trouble-free operation and less cleaning
- 70,000 to 140,000 BTU per hour
- Lights with a match
- One filling lasts 10 to 20 hours
- Burns one-half to one gallon per hour of any good grade fuel oil
- Exclusive damper for quick, easy extinguishing
- Carrying handles for easy moving.

Dealer inquiries invited.



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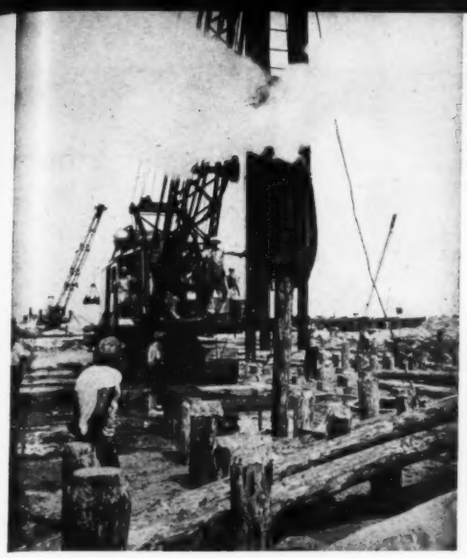
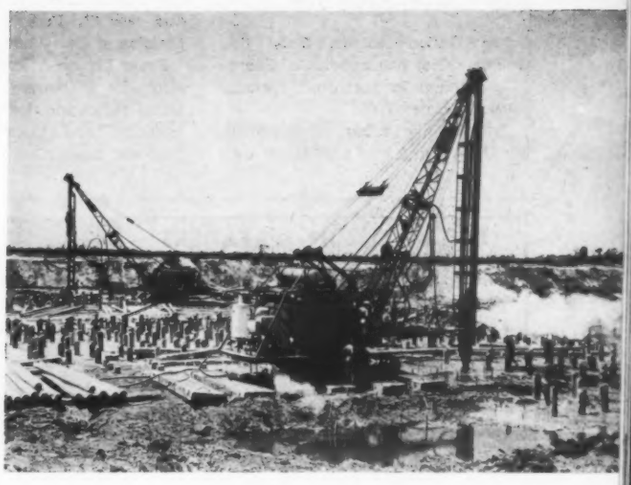


After the pile has been pushed into the 14-foot hole in the sand, a McKiernan-Terry 9B3 double-acting steam hammer drives it to 15-ton bearing. A total of 11,000 piles were required on the job.



These two Northwest cranes, using McKiernan-Terry 9B3 hammers, drive a total of about 200 timber piles per 8-hour day on the Miami sewage-treatment plant job.

ing the pile directly over the hole. (The axes of the drop-hammer jet and the leads are both at the same radius from the center of the rig). A McKiernan-Terry 9B3 hammer is then lowered onto the pile and drives it to 15-ton bearing.

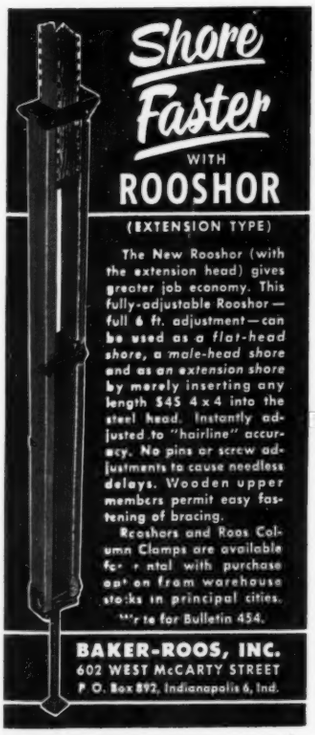
Steam Generator

Another feature of Smith's rigs that helps streamline the pile-driving work is the new McKiernan-Clayton steam generator. Each Northwest mounts one of the 2¼-ton units behind the cab to act as a counterweight.

The new generator is simple to operate and is almost completely self-contained. It requires only a water line, a drum of heating fuel, and gasoline for a small engine. A forced-draft system eliminates the need for big stacks.

From a cold start, the McKiernan-Clayton generator is ready to supply steam at full pressure within three minutes. Once it is running, the generator cycles on and off in response to the load, limiting fuel consumption.

(Concluded on next page, Col. 4)



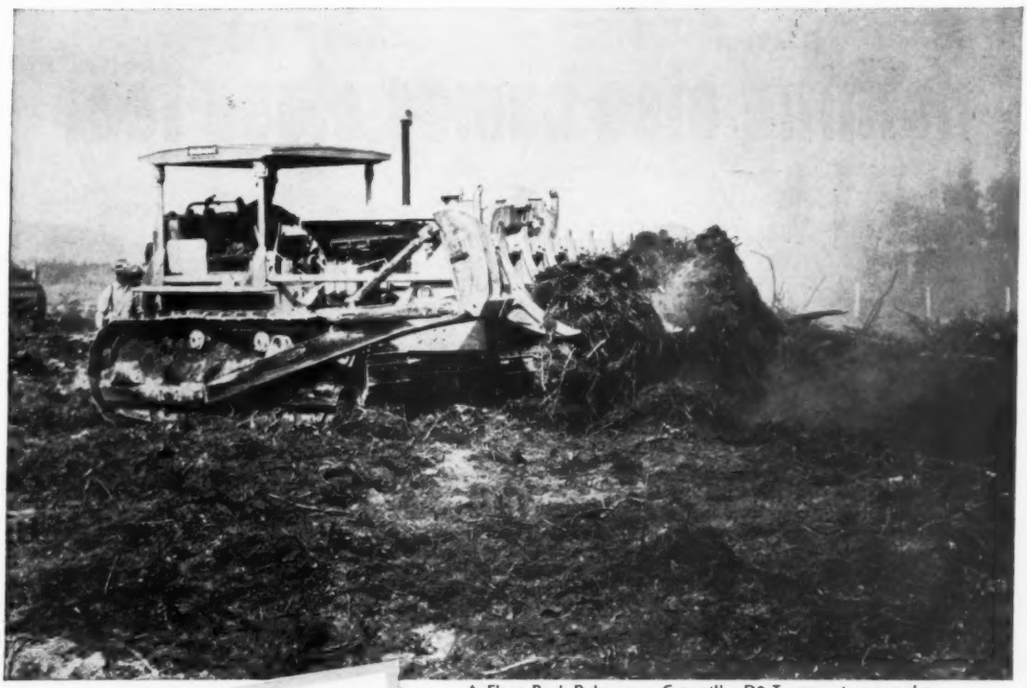
Shore Faster WITH ROOSHOR

(EXTENSION TYPE)

The New Rooshor (with the extension head) gives greater job economy. This fully-adjustable Rooshor — full 6 ft. adjustment — can be used as a *flat-head shore*, a *male-head shore* and as an *extension shore* by merely inserting any length S4S 4 x 4 into the steel head. Instantly adjusted to "hairline" accuracy. No pins or screw adjustments to cause needless delays. Wooden upper members permit easy fastening of bracing.

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities. Write for Bulletin 454.

BAKER-ROOS, INC.
602 WEST McCARTY STREET
P. O. Box 892, Indianapolis 6, Ind.



A Fleco Rock Rake, on a Caterpillar D8 Tractor, gives complete, economical clearing of undesirable growth, making wasteland usable. The Rock Rake's strong cast-alloy steel teeth make it possible to stack the growth in dirt-free piles for quicker, easier burning.

CONTRACTORS:

KEEP YOUR TRACTORS WORKING THIS WINTER!

When winter closes down your road jobs, don't store your tractors — put a Fleco Rake, Stumper or Tree Cutter on them and take on money-making land clearing contracts — all winter long. There are hundreds of such jobs right around your town and Fleco tools can do the work at lowest possible cost and highest profit return. Fleco Rakes, Stumpers, Tree Cutters and other products are designed for all track-type tractors equipped with a dozer frame and controls, for lucrative land clearing. Your Fleco-Caterpillar Dealer will help you pick the Fleco Equipment to do the work in your territory. Call on him for profitable details or write direct.

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ROOT RAKES • ROCK RAKES • BRUSH RAKES
ROOT CUTTERS • TREE CUTTERS • TREEDOZERS
UNDERCUTTERS • V-PLANES • SUBTILLAGE
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YOUR FLECO DEALER
IS YOUR CATERPILLAR® DEALER

New Galion Sales Mgr.

The Galion Allsteel Body Co., Galion, Ohio, has appointed George J. Bockmann as northwest regional sales manager.

Prior to his present appointment, Mr. Bockmann was associated with the Omaha Body & Equipment Co. and the St. Paul Hydraulic Hoist Division of Gar Wood Industries, Inc.

From his headquarters in Omaha, Nebr., he will direct sales of Galion dump bodies and hoists of 3 to 60-ton capacity, and Galion Load-evator rear-end loaders.

USE SWENSON SPREADERS FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE!

Spreads Narrow Strip or Full Traffic Lane

Spreads all materials. Salt, cinders, sand, calcium chloride, rock chips, etc. Adjustable to spread any desired quantity in any width from a narrow strip to a full traffic lane.

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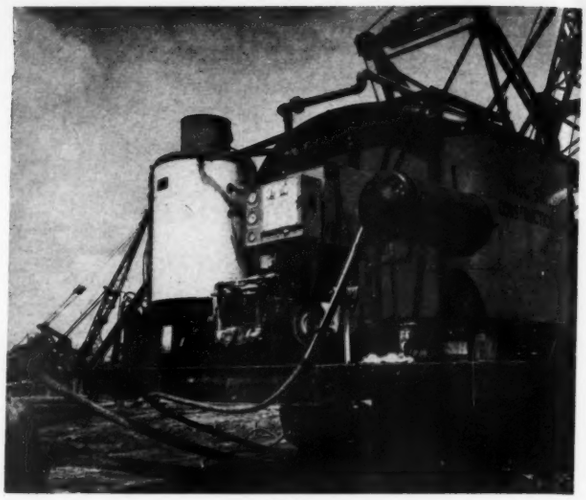


Within three minutes from a cold start, this new McKiernan-Clayton steam generator supplies steam on the job. An Onan gasoline engine powers the water pump, fuel pump, and blower.

(Continued from preceding page)

An Onan 10-hp gasoline engine powers the water pump and the fuel-oil pump, and runs a small generator which supplies electricity to the blower motor.

The unit is rated at 110 hp and operates at between 65 and 150 psi. The steam outlet is 2½ inches and the water supply inlet is ¾ inches.

J. Y. Gooch is project manager for Paul Smith Construction Co. B. W. Harig is resident engineer for Metcalf & Eddy, Boston, Mass., supervising engineer. W. A. Glass is director of the Department of Water and Sewers. THE END

"nothing else comes close to it"

PAYLOADER tractor-shovel does many jobs on 7 million dollar building contract

VERNON C. NEAL, INC. of Pittsburgh, Pa. has over 7 million dollars of contracts in Columbus, Ohio involving 73 apartment houses and a large school. Speaking of their Model HM 4-wheel-drive "PAYLOADER" Supt. Allen says, "It is one machine that is paying for itself. We just work h . . . out of it. Nothing else can come close to it."

Pouring concrete into wall forms, as shown, the machine places 40 yards a day. Using a 20 foot boom, it also hoists concrete blocks to second-story construction. These are two of its special jobs in addition to its many applications with standard bucket. In use for over a year, it has had no "down time".

Whether you're a contractor or a public works official, a "PAYLOADER" tractor-shovel can help you solve more earth-moving and material-handling problems than you can imagine. They've proven it in thousands of cases — they're proven by millions of hours of accumulated work time.

There's a size and model of "PAYLOADER" to fit *your* needs . . . bucket capacities from 12 cu. ft. to 2 cu. yd. — 4-wheel-drive types . . . front-wheel and rear-wheel drive types. Your Hough Distributor will be glad to demonstrate — see him today or write The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Illinois.

PAYLOADER®
THE FRANK G. HOUGH CO. · LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

How to Drive Studs With Powder-Actuated Tool

■ A booklet detailing how to use its powder-actuated fastening tool, the Model 450 Stud Driver, is available from the Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn.

The literature uses diagrams to illustrate the proper studs required for each use. It covers stud fastening through steel or wood into concrete, through wood into steel, and through steel into steel. It also lists recommendations for driving into concrete or steel when attaching predrilled fixtures.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 672.

Line of Salamanders And Heating Torches

■ Literature on a line of salamanders is offered by Weldit, Inc., 990 Oakman Blvd., Detroit 38, Mich. The Weldit Heaterama salamanders are available in a floor-type unit and a tank-top model, and both operate off any standard LP tank. Generating in excess of 151,000 Btu per hour, these portable units require no priming or pumping and are smokeless.

Also shown in this leaflet is a line of atmospheric air and LP heating torches for preheating and melting tar and asphalt and for thawing.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 673.

CONVENTION CALENDAR

November 9-11 American Association of State Highway Officials

Meeting, Olympic Hotel, Seattle, Wash. Hal H. Hale, executive secretary, AASHO, 917 National Press Building, Washington 4, D. C.

November 15-19 National Ready Mixed Concrete Association

Ninth Annual Short Course of Instruction on Concrete and Concrete Aggregates, University of Maryland, College Park, Md. Stanton Walker, director of engineering, NRMCA, 1325 E St. N. W., Washington 4, D. C.

November 17-18 National Constructors Association

Meeting, Hotel Jung, New Orleans, La. C. B. Bronson, secretary-treasurer, NCA, 50 E. 41st St., New York, N. Y.

November 29 Bituminous Concrete Producers Association of New York State

Tenth Annual Convention, Statler Hotel, Buffalo, N. Y. Gus Rayner, executive secretary, BCPA, Box 667, Albany, N. Y.

December 6-8 Illinois Structural Engineering Conference

Third Annual Conference, University of Illinois, Urbana, Ill. Professor R. K. Newton, Division of University Extension, 116 Illin Hall, University of Illinois.

December 9-10 Mississippi Valley Flood Control Association

Meeting, Roosevelt Hotel, New Orleans, La. Bruce Tucker, executive vice president, MVFCA, Suite 203, Hotel Peabody, Memphis, Tenn.

January 5-7, 1955 Northeastern Weed Control Conference

Meeting, Hotel New Yorker, New York, N. Y. Dr. R. J. Aldrich, secretary, Farm Crops Department, Rutgers University, New Brunswick, N. J.

January 9-13 National Ready Mixed Concrete Association and National Sand and Gravel Association

Twenty-fifth Annual Convention of National Ready Mixed Concrete Association and thirty-ninth Annual Convention of National Sand and Gravel Association, Miami Municipal Auditorium, Miami, Fla. Vincent P. Ahearn, executive secretary, NSGA, 1325 E St. N. W., Washington 4, D. C.

January 10-13 American Road Builders' Association

Exhibit of Highway Materials and Supplies to be held in conjunction with Annual Meeting, Roosevelt Hotel, New Orleans, La. Norman T. Almquist, administrative services manager, ARBA, World Center Building, Washington 6, D. C.

January 11-14 Highway Research Board

Meeting, National Academy of Sciences, Washington, D. C. Fred Burggraf, director, HRB, 2101 Constitution Ave., Washington 25, D. C.

January 23-27 Associated Equipment Distributors

Meeting, Conrad Hilton Hotel, Chicago, Ill. P. D. Hermann, executive secretary, AED, 30 E. Cedar St., Chicago 11, Ill.

January 31-February 4 American Society for Testing Materials

Meeting, Spring Committee Week, Netherland-Plaza Hotel, Cincinnati, Ohio. G. A. Wilson, senior assistant editor, ASTM, 1916 Race St., Philadelphia, Pa.

February 7-9 Association of Asphalt Paving Technologists

Meeting, Jung Hotel, New Orleans, La. Ward K. Parr, secretary-treasurer, AAPT, P. O. Box 376, Ann Arbor, Mich.

Sherman Heads Dam Project

The Little Rock District of the U. S. Army Corps of Engineers has appointed Lincoln F. Sherman project engineer at Table Rock Dam, which will be built on the White River, near Branson, Mo.

With the Corps of Engineers for 22 years, Mr. Sherman has served in the Memphis district, at Little Rock, and as assistant engineer in charge at Bull Shoals.

Handbook of Practical Design and Construction

"Time-Saver Standards," an 888-page fully illustrated handbook of designing and construction, has been published in a big new third edition by F. W. Dodge Corp., New York 18, N. Y. The book has been compiled by the editors of *Architectural Record*, magazine of architecture.

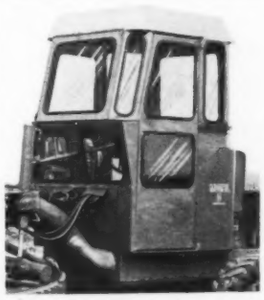
Representing the work and research of hundreds of architects, engineers, and other construction industry experts, the book guides the building professional in the design and construction of buildings, sewage and plumbing facilities, and many other projects. Details of construction are carefully explained and illustrated.

Priced at $12.50, "Time-Saver Standards" may be ordered from F. W. Dodge Corp., 119 W. 40th St., New York 18, N. Y.

New Edition of Map

A new edition of the Port of New York Authority's Metropolitan New Jersey-New York Highways map is now available free of charge at all Port Authority bridges, tunnels, and airports, and at its main office at 111 Eighth Ave., New York 11, N. Y.

The new four-color 16×18-inch map shows major highways in the New Jersey-New York Port District, and includes approaches to the George Washington Bridge and the Lincoln and Holland Tunnels.



COULD YOU SMILE ABOUT A "BAD-WEATHER" JOB?

You Can If Your Tractor Is Equipped With a CAMPBELL "ALL-WEATHER" CAB

CAMPBELL CABS Provide
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- Complete Visibility for the operator
- Opportunity to work — REGARDLESS of weather

ALL models have safety glass and aluminum tops CAMPBELL CABS are available for most tractor models. For complete information, write to:

CAMPBELL DETACHABLE CAB CO.
WAUCONDA ILLINOIS

Lowers the boom on maintenance costs with TIMKEN® bearings to take shock loads

TO help keep its newest, largest dragline—Model 1855—doing a rugged job with minimum time-out for maintenance and repairs, the Harnischfeger Corp. relies on 15 Timken® tapered roller bearings at vital points. Some of these applications are the intermediate swing shaft, digging and hoist drum shaft, bevel pinion shaft and fairlead.

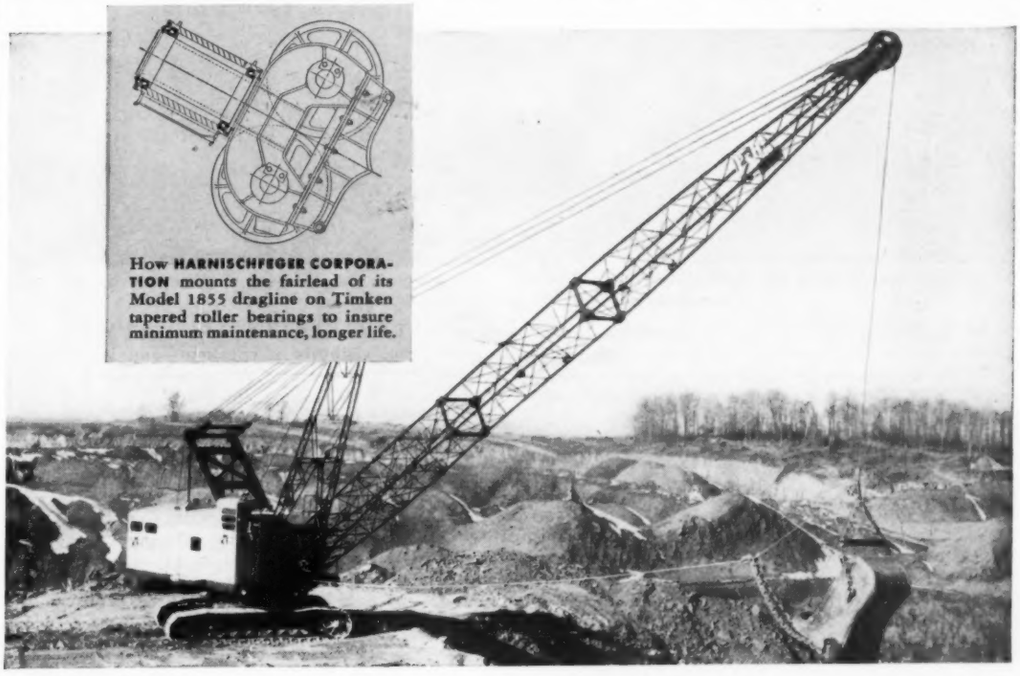
Imagine the shock loads put on the intermediate swing shaft when the cab, the boom and an 8 yard load of dirt being swung through the air are suddenly stopped and the direction reversed! Timken bearings take such shock loads with ease. That's because their rollers and races are case-carburized to give them tough, shock-resistant cores under hard wear-resistant surfaces.

The Timken bearings on the digging and hoist drum shaft take the full weight of lifting and lowering the loaded bucket. Full line contact between rollers and races of Timken bearings gives them the extra load carrying capacity they need. And due to their tapered design, they carry both radial and thrust loads in any combination. Timken bearings take the thrust loads from the pinion gears and fairlead, insure accurate alignment. Gears mesh smoothly, last longer.

To get steel good enough for Timken bearings, we had to make our own. We're the only U. S. bearing maker that does. So always specify Timken bearings. They give longer life with less friction. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How HARNISCHFEGER CORPORATION mounts the fairlead of its Model 1855 dragline on Timken tapered roller bearings to insure minimum maintenance, longer life.



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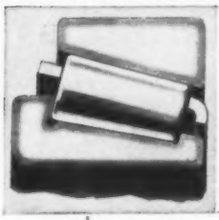
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

Overhead Tripper Conveyor Stockpiles Aggregates for Dam

A SYSTEM OF belt conveyors 2,000 feet in length is doing the complete job of stockpiling, reclaiming, and transporting aggregates at the Roanoke Rapids Dam project in North Carolina.

Both coarse and fine aggregates are stockpiled from an overhead tripper-type conveyor, reclaimed beneath in a tunnel, carried on another conveyor through a rescreening and washing unit, and then elevated to the bins on top of the mixing plant. The installation is efficient, reliable, and provides enough storage for 30 days in case of aggregate supply difficulties.

Roanoke Rapids Dam is a $30 million hydroelectric development of the Virginia Electric & Power Co., Inc. Stone & Webster Engineering Corp., Boston, Mass., is the contractor.

The structure will be a gravity-type concrete dam nearly 3,000 feet long with both nonoverflow and spillway sections. About 285,000 cubic yards of concrete is required. The 5,000-acre reservoir formed behind the dam will provide a much-needed recreation area 8½ miles long for local residents.

All aggregates are being supplied by local quarries because there is no usable gravel in the Roanoke River, and also because the rock excavated for the powerhouse and tailrace is not suitable.

With the help of a Hewitt-Robins car shaker, coarse aggregate is dumped from a gondola car into the 70-ton hopper below the tracks. At right, a truck dumps sand into an adjacent hopper.

C&E Staff Photo

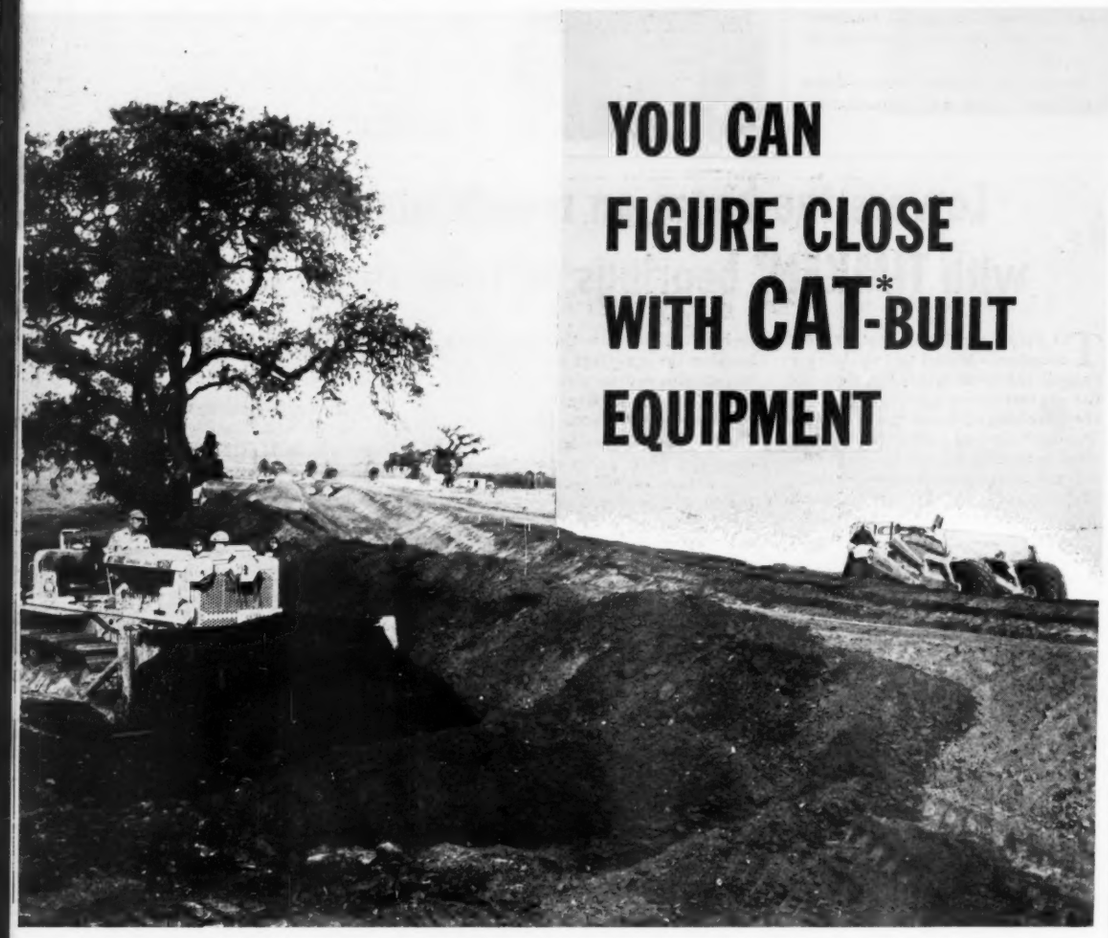
Aggregate Handling

The aggregate-handling system begins at a Seaboard Air Line railroad siding built into the dam site by the contractor. Cars carrying coarse aggregate are unloaded into a 70-ton hopper below the track. A Hewitt-Robins car shaker, raised and lowered by an electric hoist that is mounted on an overhead trolley, helps loosen the stones from the sides of the cars.

Fine aggregates are trucked in and dumped into a 70-ton hopper next to the previous one. One type of aggregate at a time is fed from a hopper onto a 168-foot-long and 30-inch-wide belt conveyor, and carried to a transfer tower. Here the material drops onto a belt running at right angles to the first. It travels up a 150-foot incline conveyor and then moves on along the horizontal stockpile conveyor 38 feet above ground. At the proper stockpile position, a belt tripper unloads the aggregate over one side of the conveyor to the stockpile below.

The overhead conveyor is supported on steel bents spaced 40 and 60 feet apart. Rock ladders are used on the coarse aggregate to eliminate breakage from a long drop.

The belt-propelled tripper rides on 30-pound rails and travels 50 feet per minute. The belt unloads into a spout as it reverses over a 24-inch-



WHETHER you're bidding on a large or small contract, you can figure close with big yellow equipment—and this Cat D8 Tractor with No. 8S Bulldozer is a mighty good example why. Here you see it working on an $80,000 contract for a flood-control ditch near Milpitas, Calif. Other Caterpillar units on the job for McGuire & Hester, Oakland, include a D6 with No. 6S Bulldozer pulling a sheepsfoot tamper and two DW10 wheel-type Tractors with No. 15 Scrapers.

Statistics of the job: length—14,000 ft.; bottom—10 ft. to 22 ft.; slope—1½ to 1 with 8-ft. crown; average depth—6½ ft.; total excavation—60,000 cu. yd. of adobe and some free dirt. General Superintendent Charles A. Aldrich reports: "We've been using Caterpillar-built equipment for 15 years and are well satisfied with its operation and the service facilities and parts procurement of our dealer."

Like all machines built by Caterpillar, the D8 Tractor with No. 8S Bulldozer is built to do *more* work at *lower* cost with *less* down time than any competitive unit. For example: the blade's capacity is *matched* with the D8's horsepower, weight and traction for *big* production. Scientifically designed to *roll* the dirt before it, it also has *maximum* strength at points of stress. Tilt or tip adjustment is easy. And from the D8's seat, visibility is excellent—and low-effort steering gives the operator the positive control of each track he needs for fast maneuvering.

Another asset on *any* contract—fast parts procurement and on-the-spot service from your nearby Caterpillar Dealer. He's a reliable source of information, too. Ask him about the new, more powerful, heavier D8—a 38,155-lb. husky with 150 drawbar HP, exclusive oil clutch, "self-energizing" steering clutches and other big-production features. He'll be glad to demonstrate the boss of the crawlers on your job!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

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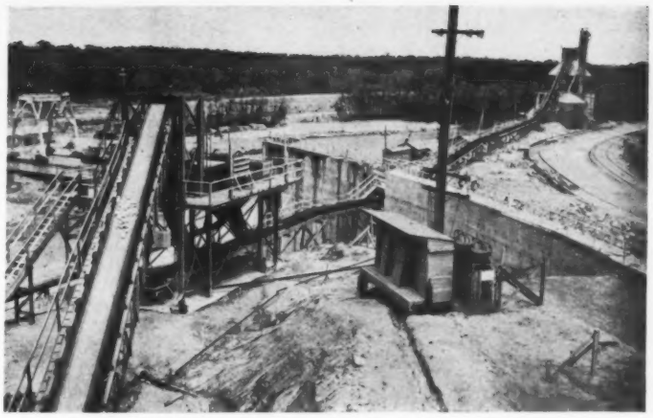
NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

Both coarse and fine aggregates move from hoppers beneath the track onto a 30-inch Hewitt-Robins conveyor belt, left, and are transferred to a 150-foot incline conveyor and to a horizontal conveyor for stockpiling. Aggregates are reclaimed in the tunnel running beneath the stockpiles.

C&E Staff Photos



After having been reclaimed and run through the washing and screening unit at left, the material is carried to the Johnson automatic batch plant, right, on a 515-foot conveyor.

diameter roller. A second roller places the belt back on the conveyor idlers.

Reclaiming Tunnel

Beneath the six stockpiles, a 36-inch belt conveyor runs in a reclaiming tunnel made of wood stringers and bents. Feeders are required to move the sand and the 6-inch aggregate onto the belt. Syntron feeders are used with the sand, and a Hewitt-Robins 60 × 30-inch vibrating feeder with the 6-inch cobbles. Gates are opened manually.

The 650-foot tunnel conveyor carries the aggregates outside to two Hewitt-Robins Eliptex double-deck units that wash and rescreen the coarse aggregates. Screened fines are stockpiled for further use.

The final leg of aggregate-handling system is a 515-foot belt conveyor that carries material from the Eliptex unit to the top of the Johnson automatic batching and mixing plant. A swivel chute directs the proper-size aggregate into any one of the five 400-cubic-yard bins.

All conveyors are Hewitt-Robins, powered by 30 and 50-hp motorized head pulleys.

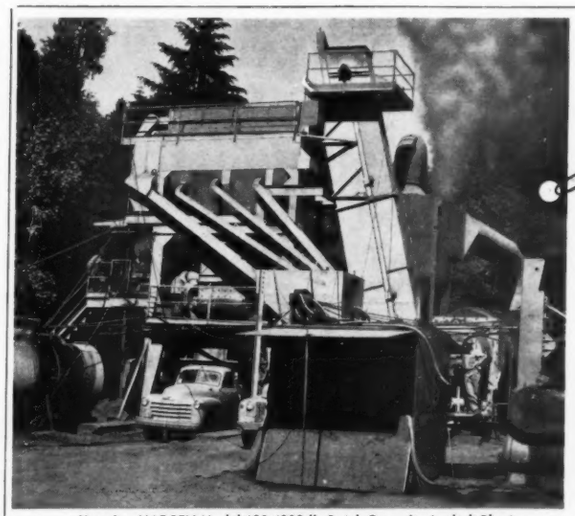
Bulk cement cars are brought in on a railroad siding and unloaded into hoppers below the tracks. Because a high rock bluff made it impossible to bring the railroad siding closer than 100 feet from the batch plant, the contractor could not use the conventional screw-conveyor method to move the cement to the storage silo. Instead, a Fuller airslide was installed. Operating as a pneumatic-type conveyor, the airslide moves an average of 400 barrels of cement per hour. A 10-inch-square pipe carries the cement to a bucket elevator which charges both the 5,000-barrel silo and the batch bins.

Concrete is mixed in three Koehring 2-yard tilting-type mixers set on a platform below the batchers. The mixers dump into a common hopper. From 4 to 5 per cent of Protex air-entraining agent is added to the mix.

Concrete Placing

During the earlier stages of the job, a Manitowoc 4500 crane placed

(*Continued on next page*)



Here is a MADSEN Model 481 4000-lb. Batch Capacity Asphalt Plant in full operation. This plant, used on three highway jobs during the 1953 season in the State of Oregon, produced as high as 1452 tons of Class "B" Asphaltic Concrete mix in a day's operation in spite of adverse rainy conditions.

Here's ASPHALT PLANT EFFICIENCY You Can See

One look at the MADSEN Model 481 Asphalt Plant tells you that here's an outstanding example of superior designing and engineering. The overall massive appearance of this plant, shown in full operation at the left, is readily apparent. Note the press-broke steel columns and legs, which give the plant increased accessibility without interference . . . the larger operating platforms and complete stairway and caged ladderway structures, all unit-built for ease of handling and assembly . . . the operator station on the end of the plant away from fumes and heat . . . and the combination overflow and reject bin on the side of the plant for ready accessibility. These features you can see, and there are many more in-built features in this outstanding plant that give you greater production, easier accessibility, lower maintenance costs and faster set-up . . . features that add up to more profits on every job. A few of the big MADSEN Model 481 advantages are listed below.

CHECK THESE MADSEN ADVANTAGES

Oversize capacity weigh-box with air-operated gate. 4-point lever suspension, roller mounted so that it may be quickly rolled out of the way for field maintenance.

In-built duct work to relieve pressure on mixer weigh-box housings, bin, hot elevator and screen housings to draw off vapors, moisture and dust.

New MADSEN Model 440 Twin-Shaft Pug Mill Mixer (Patent Pending) with improved mixing action, faster discharge, built-in oversize capacity and precision-ground, externally removable sectional liners.

MADSEN Pressure Injection System (Patent No. 1987243) which pumps the asphalt into the mill in 5 to 7 seconds.

Exclusive bin design (Patent Pending) eliminates segregation, provides uniform aggregate withdrawal, and promotes improved aggregate distribution in the weigh-box.

Improved sampling mechanism for obtaining bin samples easier, quicker and with greater accuracy.

Finger-tip control of weighing and mixing levers centrally located for maximum efficiency.

In-built reserve capacity. The MADSEN Model 481 may be purchased as a 4000-lb. plant and in later years be converted to a 5000-lb. or 6000-lb. unit.

MADSEN MODEL 481 ASPHALT PLANT

Write today for your copy of Catalog No. 800 and name of your nearest MADSEN distributor.

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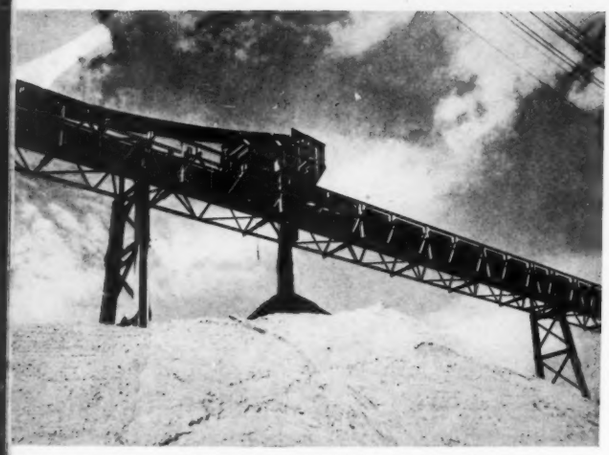


A closeup of the Hewitt-Robins belt-propelled tripper as it unloads sand from the conveyor belt, dumping it over one side of the conveyor onto the stockpile. *C&E Staff Photo*

(Continued from preceding page)

all the concrete with 4-yard buckets hauled from the plant in Euclid dump trucks. Later, a steel-girder bridge was built across the diversion canal and extended parallel to the axis of the dam to a point near the north abutment. A revolving crane mounted on a traveling gantry was erected on the bridge and is now handling nearly all of the concrete placing.

Hopper cars are loaded with concrete at the batch plant and hauled out on the bridge by General Electric 25-ton locomotives. At the pour, the cars chute the concrete into 4-yard buckets set in movable frames hung from the sides of the girders. Cars contain three or four hoppers and have remote control features that permit workmen on top to move the units in line with the buckets.

Concrete is placed in the monoliths between Blaw-Knox cantilever forms. The 5-foot lifts are built up in steps by keeping the core concrete always higher than the face concrete. (Core concrete is designed for 1,800 psi and face concrete is designed for 2,500 psi.) Two or three Chicago Pneumatic two-man vibrators consolidate the concrete. Forms are stripped in 48 hours, moved up, and prepared for the next lift. Successive lifts may be poured every 72 hours. Water curing is continued for 14 days.

Stone & Webster first moved in on the job in June, 1953, and set up a yard on the south side of the river. Over 8,000 feet of permanent and 11,000 feet of temporary railroad track was built to serve the aggregate-handling system, yards, shops, and concrete placing.

One of the first jobs on the dam itself was to build a crib-type cofferdam to confine a diversion canal along the south bank of the river. This canal has to be kept open during most of the dam construction to provide a definite minimum flow for a small downstream powerhouse.

Other cofferdams were gradually extended out from the first to temporarily seal off the powerhouse and certain sections of the spillway. In the beginning, the river waters that could not be taken through the canal were deflected by a baffle parallel to the dam and then went through an open section near the north edge of the river.

River Diversion

During this period. the spillway was constructed with every other monolith left down. When the blocks were high enough, the spillway cofferdam was breached and the river flowed over these monoliths, leaving the north edge of the river open for work on the abutments.

In later stages, the river will be diverted through 10 × 30-foot sluices in the north abutment and the canal will be supplied through 10 × 12½-foot sluices in the south abutment.

The axis of the dam runs generally north and south across a fairly straight reach of river containing numerous islands. The 680-foot-long south abutment extends out to the powerhouse, which is about 450 feet long and 70 feet wide, with its enclosed generator room and outdoor gantry. Kaplan-type turbines delivering 35,000-brake-hp will power four generating units rated at 27,800 kva.

The main spillway is over 1,000 feet long and contains 24 monoliths, each about 42 feet wide. Piers extend above the spillway to support the bridge for the traveling gate hoist. An emergency spillway north of the main spillway extends 750 feet to the north abutment, which carries the dam 180 feet further to the rock bluff.

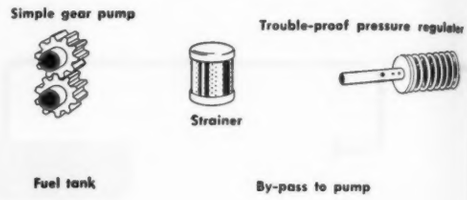
The tailrace extends 8,000 feet downstream from the dam.

Excavation for the dam totals 80,000 cubic yards, and for the powerhouse, 110,000 cubic yards. Ingersoll-Rand drills combined with Bucyrus-Erie power shovels excavated most of the material.

High-pressure jets removed overburden in the mass concrete areas. All weathered and fractured rock was excavated and holes drilled to determine the soundness of the bed.

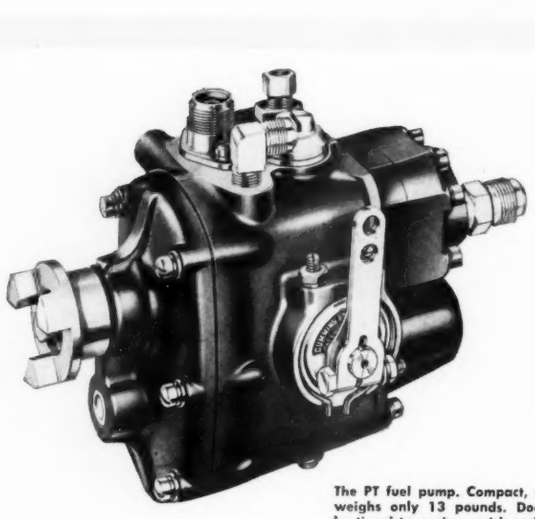
To seal off water from seeping un-

Simplest pump and fuel control arrangement



Here's the simplest diesel fuel system ever developed!

Cummins new PT *fuel system*

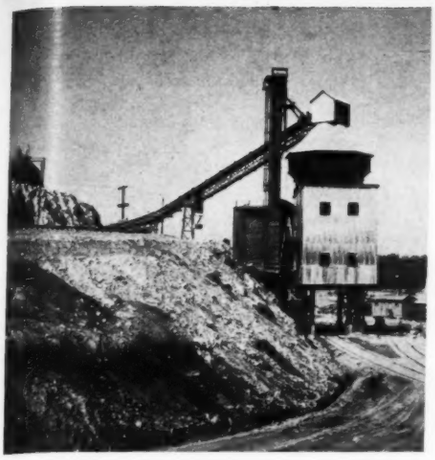


The PT fuel pump. Compact, easy to handle, weighs only 13 pounds. Does not have to be timed to engine, quick and easy to install.

The PT injector utilizes the exclusive Cummins principle of fuel injection which has set the highest standards of performance and economy for more than 20 years.

THE revolutionary new PT fuel system, now standard on all Cummins Diesels, has fewer and far simpler parts than carburetor and ignition systems or ordinary diesel fuel systems. It is easy to understand, simple to work with, can be serviced by any mechanic. No longer any need for fuel system specialists! The PT fuel system has undergone two years of field testing and millions of operating miles under every conceivable condition. Its dependability record is phenomenal. Operators report even less fuel consumption than with earlier Cummins fuel systems and far less cost of maintenance. The PT fuel system can be installed on any Cummins Diesel built since 1932.

Cummins *leader in lightweight high speed diesel power 60-600 h. p.*



At the batch plant, the proper size aggregate is dumped into one of the five 400-cubic-yard bins by a swivel chute. A Fuller air-slide moves about 400 barrels of cement per hour.

C&E Staff Photo

der the dam, grout was pumped into the rock to fill all possible seams. As a further precaution, 24-inch half-round pipe was placed along the rock bed of each monolith to drain any seeping water from drain holes drilled into the rock downstream from the grout curtain.

Contractor's Yard

Stone & Webster had installed over $1,000,000 in plant facilities alone before any work began on the dam proper. In addition to the aggregate-processing system, the contractor installed administration offices, a carpenter shop, machine shop, maintenance shop, compressor plant, lumber mill, warehouses, and a fabrication yard.

All the shops are equipped with a complete line of machines and power tools for building and repairing just about everything on the job. The compressor plant which supplies air to wagon drills and other air tools consists of a 1,700-cfm Chicago Pneumatic and three 1,035-cfm Ingersoll-Rand stationary compressors.

In addition to the usual number of tractors and power cranes, the job requires 16 Ford pickup trucks, 7 Euclid end-dump trucks, and 25 pumps ranging from ½-inch to 8-inch.

Personnel

June, 1955, is the scheduled completion date for Roanoke Rapids Dam.

D. N. McCord is project manager for Stone & Webster Engineering Corp. I. R. Kline is resident engineer. E. F. Stepanek and C. S. Robertson are superintendents, and A. R. Stuckey is assistant to the project manager. THE END

Special-Purpose Electrode For Welding Joints

■ A new electrode for welding high-tensile-strength joints has been announced by the Lincoln Electric Co., 2201 St. Clair Ave., Cleveland 17, Ohio. This new Jetweld 2 HT electrode represents another addition to the company's line of iron-powder electrodes designed for making specified types of joints rather than as all-purpose electrodes.

Jetweld 2 HT is especially designed for high-speed welding of flat-fillet and deep-groove joints where high-tensile strength and low crack sensitivity are required. According to the manufacturer, it will give X-ray quality weld at low cost and has easy slag removal, top physical properties, and smooth appearance. It operates on either ac or dc, with ac preferred.

For further information write to the company, or use the Request Card at page 18. Circle No. 622.

Steel Shoring Equipment For Concrete Construction

■ Three types of steel shoring equipment designed to efficiently handle concrete shoring jobs are described in literature available from The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y. Featured is the Trouble Saver sectional shoring, a prefabricated shoring made up of welded-steel sections that provide a scaffold within the shoring and a working level below the slab.

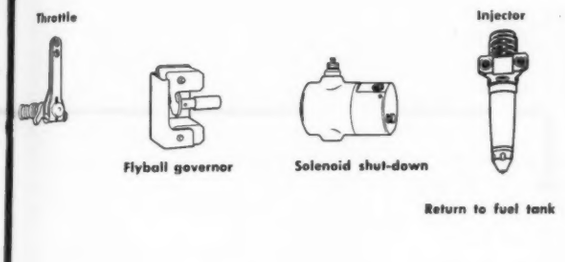
Other equipment described are: TubeLox shoring, often used to advantage on high jobs; and Burton's shores, a single-post shore that can be carried, installed, and adjusted by one man.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 633.

Prestressed Concrete Lighting Standards

■ A new catalog devoted to prestressed-concrete standards for street and highway lighting, has been made available by the American Concrete Corp., 5092 N. Kimberly Ave., Chicago 30, Ill. This catalog contains complete engineering tables and descriptive information on the design features and mounting arrangements of Hy-Lite standards.

To obtain Catalog No. 300, write to the company, or use the Request Card at page 18. Circle No. 515.



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PT advantages over ordinary diesel systems:

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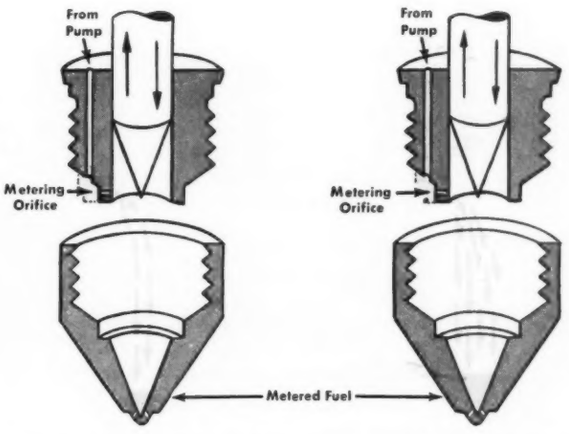
stem. simpler to work with than gasoline carburetion and ignition

Simplest Fuel Metering Device

The principle is simply that the amount of fuel flowing through a fixed orifice varies according to the amount of pressure on the fuel. Pressure is controlled by the throttle on the PT pump. Fuel flow through orifice is cut off as injector plunger, actuated by engine camshaft, moves down to inject fuel.



When engine is under partial load, fuel pressure is low, and only a small amount of fuel passes through orifice into injector cup.

When engine is under full load, fuel pressure is increased, and greater amount of fuel passes through orifice into injector cup.

Mail this today, and get more PT facts!

CUMMINS ENGINE COMPANY, INC. Dept. CE-11
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CUMMINS

The Bucyrus-Erie truck-mounted Hydrocrane shown here with excavator attachment, may now be ordered with an integral engine. ►

Truck Crane Offered In Self-Powered Model

■ The Bucyrus-Erie truck-mounted Hydrocrane, a 4-ton ⅜-yard hydraulic excavator-crane, is now available as an independently powered machine with its own 4-cylinder engine.

In addition to the elimination of the restrictive influence of the power-takeoff drive, the self-powered Hydrocrane features an improved hydraulic circuit. A foot-operated selector valve permits hydraulic fluid from all three pumps to be channeled to one valve bank, increasing line speeds up to 50 per cent.

On the Hydrohoe—the drag shovel version of the same basic machine—digging power is reported to be much greater and hoist speed faster than before. Another advantage of the direct drive is the use of fewer belts, shafts, and hoses, with less servicing required.

For further information write to the Bucyrus-Erie Co., Box 56, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 538.

Aluminum Torpedo Level

■ A new die-cast-aluminum torpedo level, said to be accurate and shock resistant, is announced by The Columbian Vise & Mfg. Co., 9021 Bessemer Ave., Cleveland 4, Ohio. The Columbian 339 level has one plumb, one level, and one 45-degree vial. Its top plate is made of red plastic, and the bottom of the aluminum body is precision-grooved for use as a line level.

The new level is 9 inches long, 1⅛ inches high, and only ⅝-inch wide at its widest point.

For further information write to the company, or use the Request Card at page 18. Circle No. 552.

Specialized Attachments For Land-Clearing Jobs

■ A Fleco catalog available to contractors describes nine different tractor attachments for clearing land of rock, brush, trees, and stumps. Each of these attachments is designed to do a particular type of clearing job.

The line includes root, brush, and rock rakes; a tree cutter and a tree dozer; a detachable rake-type stumper and a rear-mounted pull stumper; a root cutter; and a subtillage tool that slices through the ground to kill unwanted vegetation.

These tools are matched to Caterpillar diesel tractors, and also fit other track-type tractors. The booklet also shows a V-plane for Caterpillar motor graders that knifes through the ground to cut root growths.

To obtain this literature write to the Fleco Corp., Jacksonville 3, Fla., or use the Request Card at page 18. Circle No. 563.

Additive Speeds Curing Of Concrete or Mortar

■ A folder describing a cement accelerator is announced by Delrac Corp., Watertown, N. Y. According to the literature, the addition of Delrac to the concrete mix accelerates hydration for a faster cure, and hardens and densifies the concrete or mortar.

The additive will also prevent concrete and mortar from freezing at temperatures as low as 15 degrees F.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 522.

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NOTE these advantages:—

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Advantage: Eimcos are more maneuverable.

Reason: Eimcos use independent track control. Separate levers control each track and one track can be run forward while the other runs reverse.

Advantage: Eimcos last longer.

Reason: Torque converter drive is standard on Eimcos. All castings are alloy steel, all construction is extra heavy-duty.

Advantage: Eimcos load faster.

Reason: The overhead principle developed by Eimco is faster. Complete cycle is 10-12 seconds. Shifting from high to low on tractor or loader is done in motion. Shifting from forward to reverse can be done at full speed.

Other Advantages Include: Better visibility with the operator up front. Easier maintenance with clutches that never need adjustment and elimination of all clutches, brakes and gadgets in the final drive.

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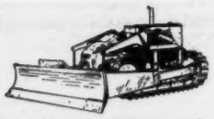

Eimco 105 with bulldozer attachment

Eimco 105

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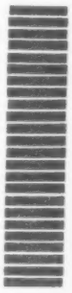

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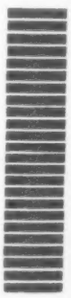

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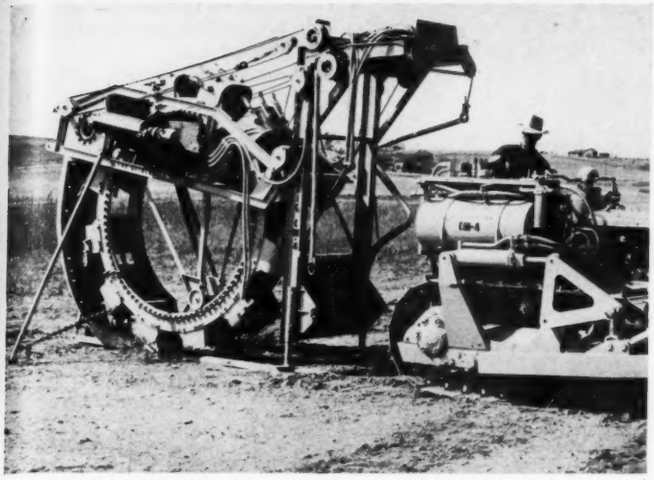

The new Unimatic detachable ditcher Model CW-4.

Detachable Ditcher For Crawler Tractor

■ A new bucket-wheel-type ditcher is designed to attach to the Caterpillar D4 diesel tractor to make a maneuverable trenching machine. According to the Unimatic Corp., P. O. Box 1166, Tulsa, Okla., manufacturer of the unit, the new Model CW-4 ditcher can be detached from the tractor in less than 30 minutes.

Digging capacity of the CW-4 is 5 feet 6 inches deep and 15 to 24 inches wide in increments of one inch. Hydraulically powered, the machine is recommended for a variety of ditching operations, including trenching for foundation footings, highway drainage, irrigation drainage, seawall foundations, and water and power lines.

Forward speed ranges from zero to 26 fpm. The ditcher's conveyor starts, stops, and reverses instantaneously and operates independent of the digging wheel.

For further information write to the company, or use the Request Card at page 18. Circle No. 649.

Fluid-Power Takeoff For Construction Rigs

■ A bulletin describing the performance of two models of the Twin Disc disconnecting fluid-power takeoff is announced by the Twin Disc Clutch Co., Rockford, Ill. Models 21 HUD-O and 27 HUD-OO, covered in the booklet, are used on drilling rigs, hoists, shovels, draglines, and for many other heavy-duty applications that demand frequent and complete disconnection of the power source from the equipment.

Bulletin No. 506 includes capacity charts and describes actual problems that have been solved with the installation of these units.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 657.

Soil Compaction Handbook

■ A good deal of information on soil compaction problems has been brought together in a manual by Gunderson-Taylor Machinery Co., 1237 Shoshone St., Denver 4, Colo. Beginning with the principle and evolution of soil compaction and the development of compaction equipment, the handbook includes also a background on various types of soils, their indentifications, classifications, and engineering characteristics.

One chapter deals entirely with soil compaction tests, including formulas and expected results. Another chapter is devoted to the procedure for sound backfill compaction, explaining the need and use of laboratory reports, compaction energy and moisture, and proper control.

The booklet also includes data on the Gunderson-Taylor Triplex backfill tamper.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 601.

Facts on Motor Grader

■ A catalog on its new Model 450 tandem-drive motor grader has been issued by Galion Iron Works & Mfg. Co., Galion, Ohio. This grader has a 75-hp diesel engine, and is in the weight range of 20,630 pounds or higher, depending on the extra equipment. Detailed information on construction and operating features, as well as complete specifications, are included in the catalog.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 536.

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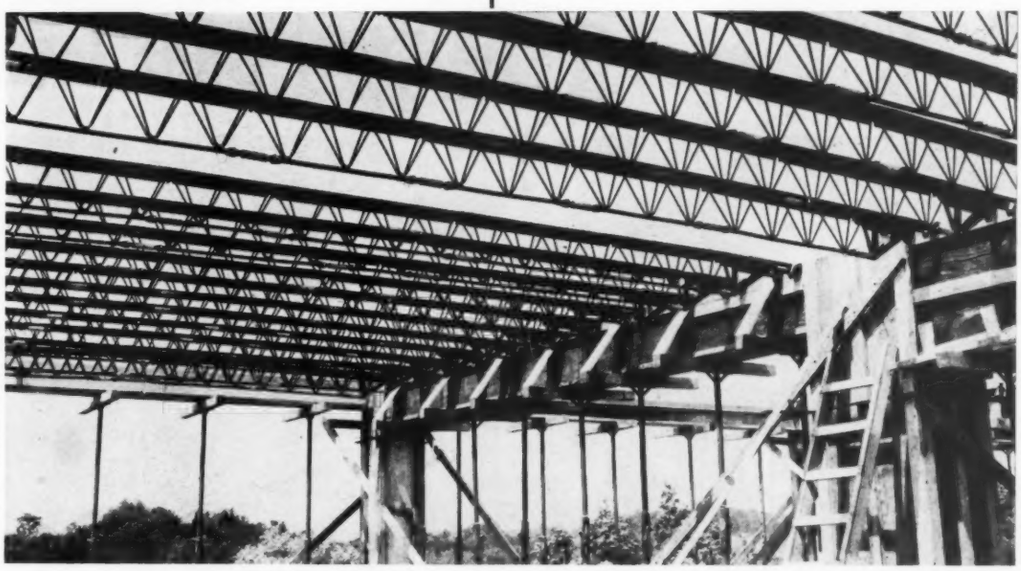

Buildings for N. Y. State College of Agriculture and N. Y. State Veterinary College, Cornell University, Ithaca, N. Y. State Architect: Cornelius J. White. Consulting Architects: Coffin & Coffin, Isadore Rosenfield. Contractor: W. E. O'Neil Construction Co.

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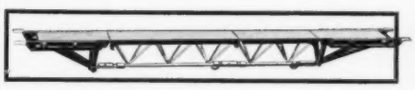

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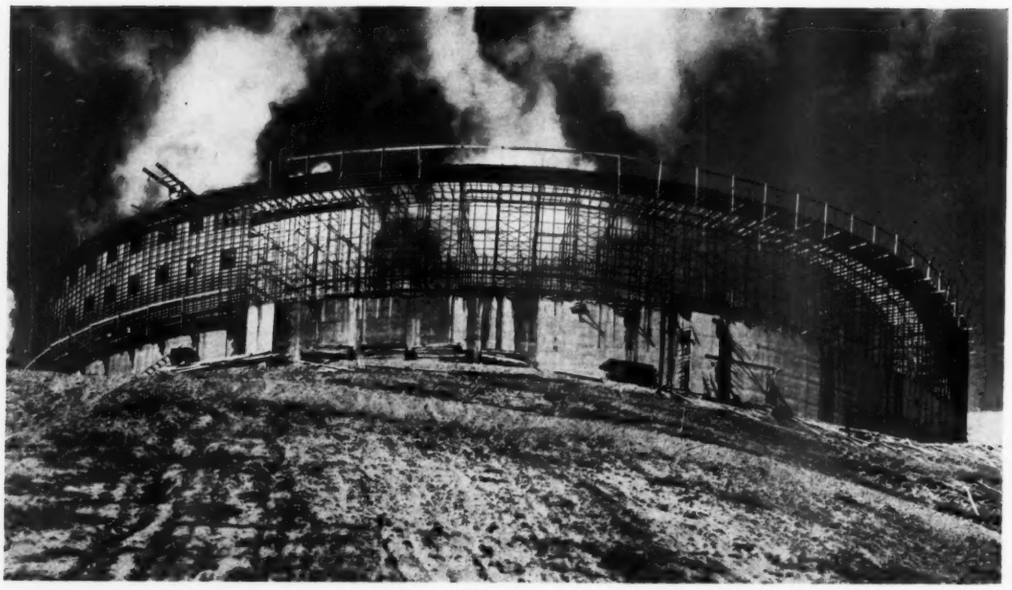
NOTICE TO DISTRIBUTORS. There are still some territories open in the United States. Write for details.

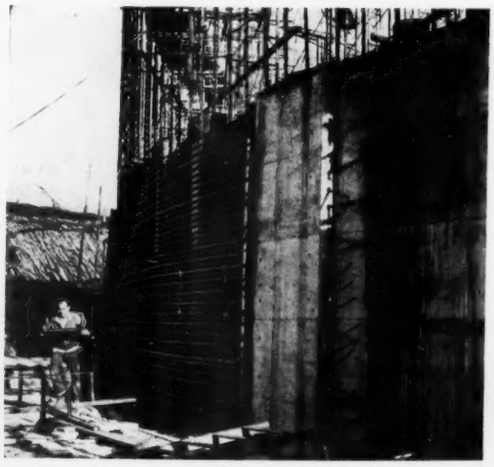
A Car-Bro concrete-placing bucket and a vibrating screed are used in paving the bottom slab of the reservoir. A 2½-inch layer of drain rock, 4 inches of asphaltic concrete, and a topping of asphalt emulsion form the base for the dish-shaped bottom.

Because the construction site was the side of a steep hill, the contractor had little working room. Access roads were carved out of the hillside. Note the contractor's shack and stockpiles on the brow of the hill just right of the tank.

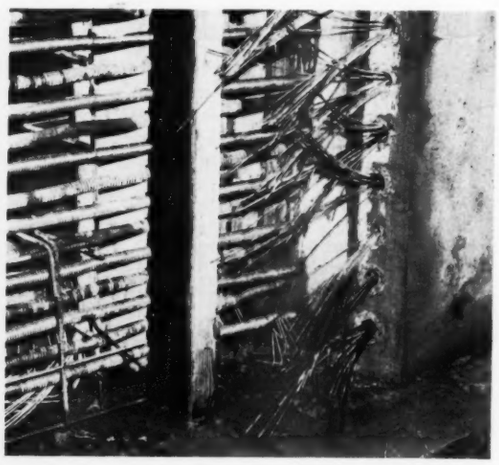
Two-Way Prestressing Built Into Huge Tank



At the halfway mark of construction, the upper part of the structure is encased in form scaffolding. Cables, which will be used in prestressing the tank horizontally, may be seen emerging from the pilasters on the lower half of the reservoir.



A close-up view of the Freyssinet prestressing cables, anchored in pilasters at 45-degree points around the lower half of the tank. Horizontal prestressing will be applied at these points.



This detail of the Freyssinet cables shows the high-tensile-strength wires which make up the cable. Flexible metal tubing encloses the wire (left).

BOTH HORIZONTAL and vertical prestressing have gone into construction of an unusual reinforced-concrete reservoir serving Oakland, Calif., and other cities in the San Francisco Bay area. Reportedly the largest structure of its kind in the world, the tank has a capacity of 12,000,000 gallons.

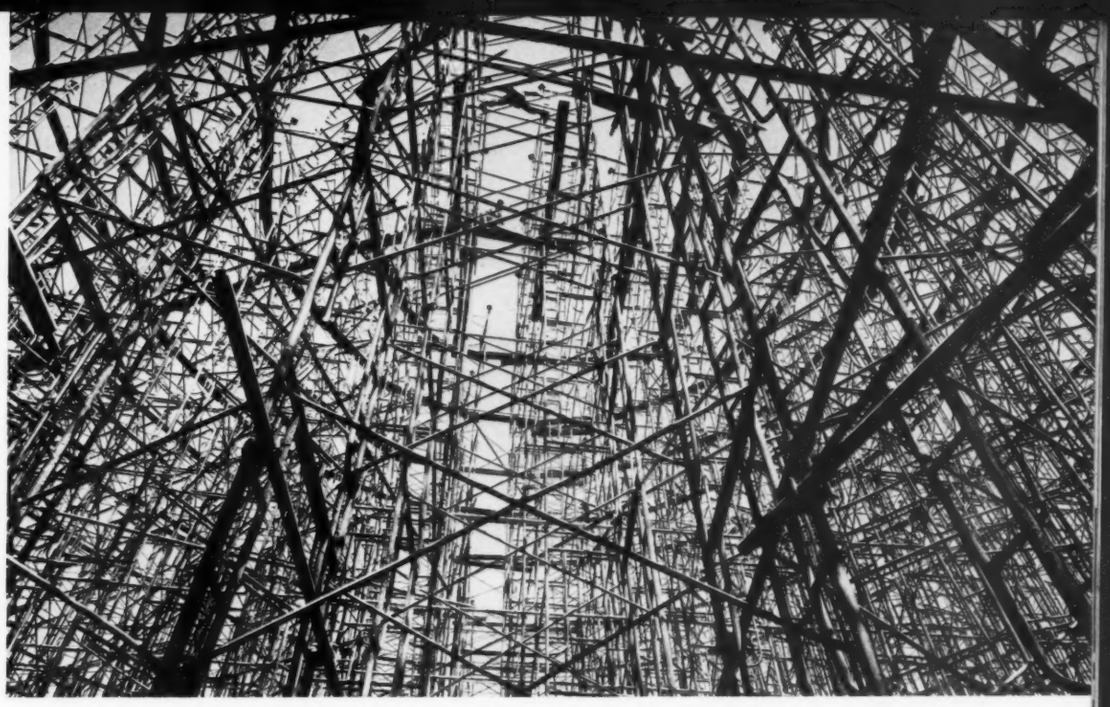
Built on the side of a huge hill (a factor which created some difficulties for the contractor) overlooking the bay at Richmond, the tank is 200 feet in diameter, 43.67 feet high, and has walls 1 to 2 feet thick. It has a dished bottom and a thin-shell reinforced-concrete dome top.

To contain the pressure on the concrete sides of the tank, miles of high-tensile-strength wire have been installed by the Freyssinet method—and for the first time on a tank this big, the huge cables have been stretched both horizontally and vertically. Even with the tank full, concrete in the walls still will be under slight compression.

Costing a total of $360,000, the tank is being built by Erickson-Phillips & Weisberg, Concord, Calif., at a contract cost of $345,423. The construction agency is the East Bay Municipal Utility District of Oakland (EBMUD), supplier of water not only to Oakland but to other cities and unincorporated areas in the vicinity.

As far as prestressed tanks go, EBMUD is in a class by itself. The new tank gives the district a total of 30 prestressed reservoirs built during the last 20 years. This is more prestressed tanks than any other agency in the nation, according to district officials. The reservoirs represent practically every method of prestressing, ranging from early bar-stressed units to the later wire-wrapped type.

Originally, the Richmond installation was designed to be wire-wrapped, but cost-conscious design engineers let bids with alternates so contractors bidding the job might have a



This forest of Safway scaffolding was erected to support the forms for the dome pour. Near the top in the picture, workmen are assembling sections of the scaffolding. Scaffold units were set on 4 x 7-foot centers.

(Additional Photo on Front Cover)

Horizontal, vertical tensioning stresses 12,000,000-gallon concrete reservoir; limited working area poses problems

By RAY DAY

choice. Erickson-Phillips & Weisberg's bid included the suggested use of the Freyssinet method, and was $16,000 below the next bidder. EBMUD's engineering officials felt they had enough prestressing judgment to decide the alternate design would be completely satisfactory. And EBMUD—like any other owner—is not averse to promoting a little competition between methods.

When the main contract for the tank was let, work was already virtually complete on the excavation item. This sizable job had been awarded under a separate contract arrangement to the Berkeley, Calif., excavation firm of John McCosker, Inc. Modern construction equipment already had been sent in to rip a suitable foundation for the huge tank out of the side of the high hill. It was primarily a job for Caterpillar D8's and LeTourneau Rooters, and for U-type bulldozers. There was a Caterpillar No. 112 motor grader there, too—primarily for sloping banks. As the dirt and rock was loosened, it was picked up by a Caterpillar D6 and an Allis-Chalmers front-end loader and hauled away by truck. Most of this dirt was sold to firms and private individuals in the vicinity.

Unique Design

The Richmond structure is believed to be the biggest, most unusually prestressed concrete tank ever built. Wall thickness has been designed so that compression will never exceed 1,000 psi. The thickness of concrete wall at the base of the tank is 24 inches, but this base thickness is reduced 2 inches for each 4 feet in height, so that 24 feet from the bottom of the tank the wall is 12 inches thick. The thickness is the same from the 24-foot point to the top, near the dome ring.

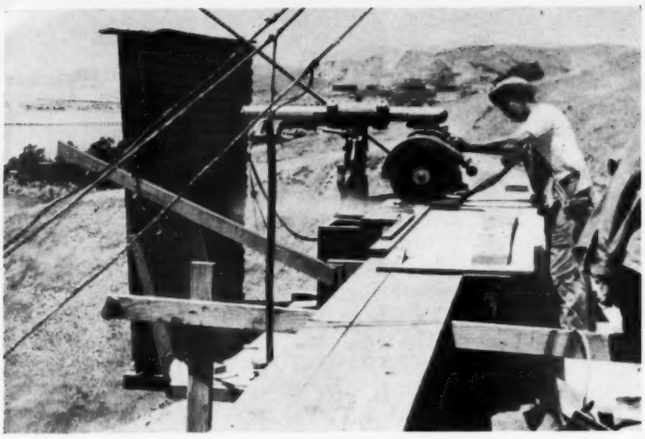
The dome ring is uniformly 24-inches thick. Reinforced concrete pilasters, built especially to anchor the prestressed wires, are generally 1 foot 10 inches thick. Only at the dome ring do they drop to variable thicknesses ranging from 2 to 10 inches. These pilasters are placed at the 45-degree points around the tank.

The big reservoir has also been designed with a watertight rubber water seal between the tank bottom and the concrete walls. EBMUD has developed its own rubber water-seal design through the years. It consists basically of a rubber tube held under compression with the aid of studs and nuts tightened by a torque wrench.

The tank foundation is well drained, so that development of any possible pressure is prevented. Drainage facilities include a 2½-inch layer of special drain rock, 4 inches of asphaltic concrete, and a topping of asphalt emulsion—all placed under the concrete tank bottom. A special underdrain system drains toward lower ground away from the tank.

Tank concrete is an especially good mix, showing 4,500 pounds of compressive strength per square inch at 28 days. A ¾-inch-maximum aggregate is used for the bottom 8 feet of the wall because of close spacing of prestressing cables. Aggregate measuring 1½ inches maximum is used from that point up to develop the necessary strength in the bottom concrete. A typical batch contains 660 pounds of cement and 35 pounds of pozzolan per cubic yard. Sufficient

With the tank walls placed and dome scaffolding erected, workmen lay sheathing for the dome form. The steel template on top of the tank is anchored to a center pin and rides a wheel at the edge of the dome ring to assure perfect spherical alignment on the dome shell.



The limitations imposed on workmen are illustrated by the position of this De Walt cutoff saw which was mounted far out over a dropoff.

(Continued from preceding page)

Darex air-entraining agent also is used to produce approximately 5 per cent of air entrainment. The water-cement ratio ranges from 4.0 to 4.7.

Fourteen thousand pounds of United States Steel's Super Tenstress prestressing wire was used. Each of the 360 horizontal cables spans 90 degrees of the tank's circumference. These cables, typical of the Freyssinet method, are sheathed in 1¾-inch flexible metal tubing. Each cable contains 18 high-tensile-strength wires of 0.196-inch diameter. Every other band of the cable is anchored in each pilaster. The net result of this arrangement is that at each pilaster, two cables in one band are anchored and the cables in the next adjacent bands are continuous. This helps, of course, to create uniformity in the prestressing loads.

Spacing of horizontal cables is varied to meet loading requirements of the tank. This spacing ranges from 3½ inches at the bottom to 24 inches just below the dome ring. There are also some extra cables in the dome ring which give it additional support. The vertical cables, which are also 18-wire units, are designed principally to resist the normal bending moment which develops in the vertical section. These cables are anchored — each wire individually — in concrete at the bottom of the tank. All told, 320 vertical cables are used with 2-foot spacing. Vertical cables are housed in light-gage pipe, which also serve to position horizontal cables because they have notches in which the cables fit. The vertical cables are designed to be stressed ahead of horizontal pulls, and this scheme has been followed closely.

The cables are locked in specially designed cones manufactured by Intercontinental Equipment Co., Inc., New York, N. Y.

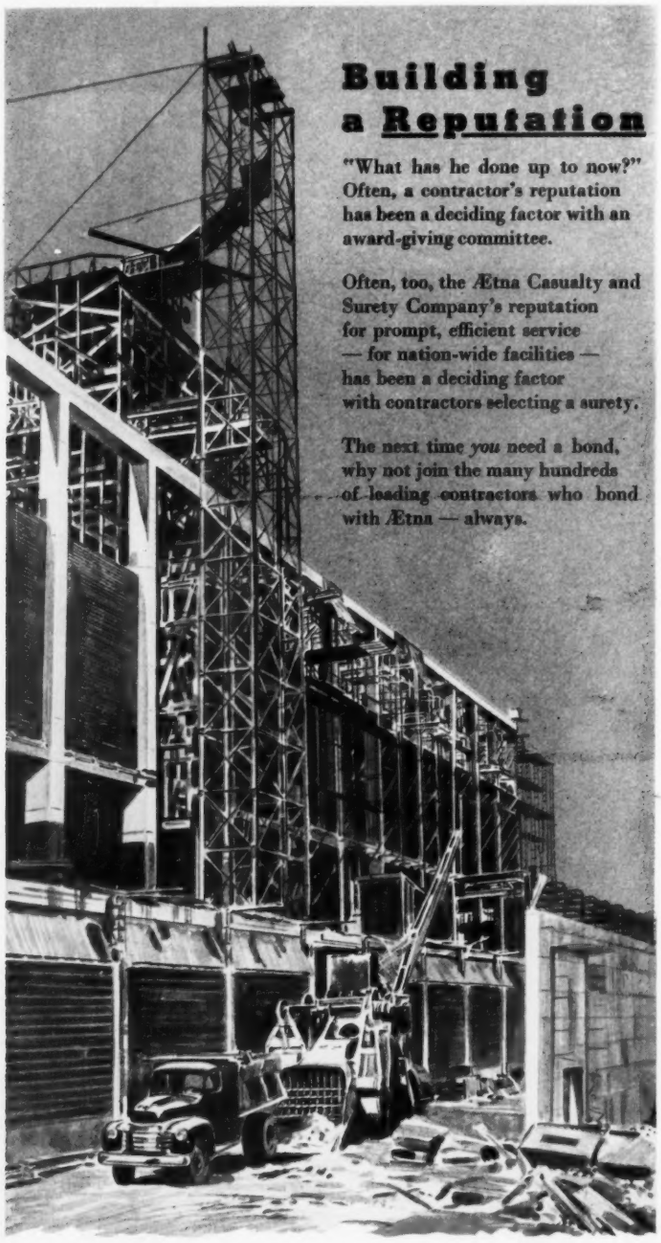
No Work Space

The job represents such careful engineering and design that one might think no construction problem existed. However, from the point of view of Walt Phillips, general superintendent for the contracting firm, very serious problems were evident from the start.

The tank's location was on a very steep hillside overlooking San Francisco Bay, and it had been impossible in the grading plans to provide for much more than the space necessary for the tank itself. Very little working room had been provided. Phillips realized that he was up against a problem which would call for close scheduling, careful ordering of materials, and such tricks as setting the carpenter shop on stilts out over the edge of the cliff to get just a few more square feet of working room.

Phillips' setup was simple but adequate. For his low forms he used standard prefab sections 8 feet long, with the plywood face nailed to standard ribs. These ribs were cut from 2 × 8 material, leaving a full 6 inches at the narrowest point. They were cut to the curve of the outer perimeter of the tank, and were set on 12-inch spacing. The 8-foot sections were so arranged that they could be joined into 40 or 80-foot pours. The sections were held together by ½-inch high-tensile form bolts with cone spreaders placed on 2 × 4-foot centers. An ingenious carriage with its own hoist was made which would ride on top of the tank to move the panels quickly. It was capable of moving and setting up an 80-foot section of pour in approximately two days.

For concrete, the contractors made arrangements with Pacific Coast Aggregates, Oakland, a firm specializing in the commercial supply and batching of concrete materials. The firm was well equipped to provide the required five mixes from its nearby batch plant. A general scheme was followed of batching out dry-weight concrete from this plant, hauling it by truck to the job, and then mixing it with water in a Mixermobile, which hoisted the material to the pour. Permanente Type II cement was used. The biggest wall pours contained approximately 100 cubic yards.



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High in the air, carpenters set forms for the sharply sloping dome of the tank. Joists measuring 4 x 6 are placed on radial alignment to support the 1-inch wood sheathing (upper left) which forms the concrete dome face.

In all its experience with construction of tanks, EBMUD has never favored horizontal joints. Original plans for the Richmond job, therefore, called for eight full-height segments 80 feet long, with an approximate 2-foot separation between each segment. Engineers believed that after the normal shrinkage took place in each segment the 2-foot separation could be safely filled.

But that scheme meant 200-cubic-yard pours would have to be made—an operation which, with the equipment on the job and the scarcity of working room, would have forced the contractors to pay expensive overtime. This and several other factors caused permission to be granted for the first time to place approximately 20 feet of wall height as a first pour, leaving a horizontal construction joint. The remaining wall would then be placed in a second pour. That would limit the pours to approximately 100 cubic yards.

The first pours were made—apparently quite sucessfully—without a single day's overtime. But it wasn't long before the mistake became evident. Shrinkage cracks began to develop in the newly poured walls. They were not numerous and they were far from serious, but they did cause serious and soberminded consultations. If the shrinkage cracks were allowed to stay in the lower sections, they might be locked in an open position when the top section of the concrete wall was placed. For this reason, project officials decided to attempt a closure of the initial shrinkage cracks by prestressing the bottom sections partially, even before the top wires were prestressed.

Soulé Steel Co., San Francisco, prestressing subcontractor, was called in, and the partial prestressing was done. Later on, these cracks were grooved on the inside of the tank and then filled with Servicized rubber joint-sealing compound.

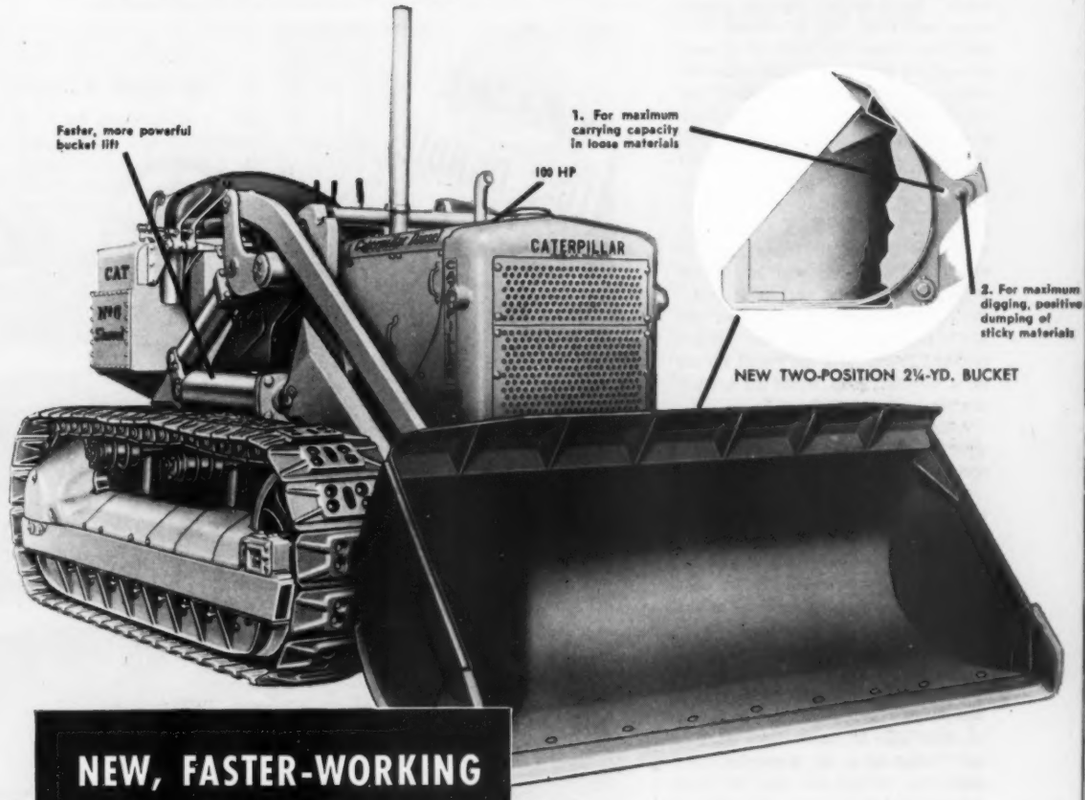
One of the more interesting parts of the big tank is the dome shell, which forms a spherical top over the structure. Minimum thickness is 4½ inches. In order to support the weight of the concrete in this dome during placement operations, a literal forest of Safway scaffolding was brought in and set on 4 × 7-foot centers. On the top of scaffold sections, 4 × 6 joists were laid on radial alignment to carry the 1-inch wood sheathing which formed the concrete dome face. A special revolving steel template anchored to a center pin and riding on a wheel at the edge of the dome ring was used to attain perfect spherical alignment on the dome shell. After the dome was poured and the necessary prestressing was done to place it in compression, it rose off the forms and they were removed.

Prestressing

There is little doubt that the force of prestressing is so great it is practically visible. Certainly it is measurable. Even in the partial prestressing at the bottom of the tank to close shrinkage cracks, only 18 pulls were made. And they succeeded in reducing the diameter of the tank ¼ inch. Hydraulic jacks were used.

The ultimate prestressing method involved two applications of stress. An initial pull was made to stress the wires to 188,000 psi. This was measured two ways: (1) by a checked 12½-inch elongation of each wire, and (2) by the development of 6,000 psi on the pressure gages which measure the hydraulic force being applied. The tension was applied by jacking from both ends simultane-

ANNOUNCING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W. B. Bradbury (left), resident engineer for the East Bay Municipal Utility District, and Walt Phillips, superintendent for Erickson-Phillips & Weisberg on the job, express satisfaction with the way work on the dome is going.

ously. Since initial stresses always relax somewhat, due to various factors, and since the ends of a wire always are stretched tighter than the center portion farther around the curved surface of a tank, it was assumed that the least-stressed portion in the center of each wire would reach a top tension of approximately 146,000 psi. These center sections, however, were expected to coincide with the tightly stretched ends of other wires, which will ultimately relax from 188,000 psi to approximately 166,000 psi. These then will act to balance out the weaker 146,000 banding forces, and the result should be a uniform load stress all around the sides of the tank.

After prestressing, the conduits were pumped full of mortar to protect the wires from corrosion.

The job is scheduled for completion this month. EBMUD has recently awarded the same contractor a 51,000,000 gallon reservoir of an open type which will be built near Hayward at the Southern end of the utility district's service area.

Personnel

The Richmond prestressed tank job, like other construction undertakings of EBMUD, is under the general supervision of R. C. Kennedy, chief engineer. Design for the big tank was worked out under the general supervision of J. W. Trahern, supervising civil engineer, with the aid of C. F. Yerby, L. H. Lee, and V. M. Gallo. Field supervision of construction is under both George Colby, construction supervisor, and W. B. Bradbury, resident engineer. The contractor's operations are under the direct supervision of Walt Phillips, general superintendent. THE END

Monthly Bulletin Covers Dump Bodies and Loaders

■ Publication of the *Galion Gab*, a monthly bulletin, is announced by The Galion Allsteel Body Co., Galion, Ohio. Distributed to the Galion field sales organization, the bulletin features articles describing new or unusual applications of Galion products, customer comments, reprints of current advertisements, and information pertinent to the Galion line of dump bodies, hoists, and Load-evator loaders.

Copies of current issues can be obtained by writing to the Sales Department, The Galion Allsteel Body Co., Galion, Ohio.

Steam Cleaning Gun

■ A new steam-solution cleaning gun, suitable for cleaning and paint stripping of all types and sizes of machinery and equipment, is announced by the Equipment Division of Magnus Chemical Co., Inc., South Ave., Garwood, N. J. The gun operates directly from a supply of live steam, a container of cleaning solution, and hose lines. Booster pump, motor, or tank are not required.

The passage of the steam through the gun siphons the cleaning solution into the gun, where it mixes with the steam and is then discharged from the high-velocity nozzle. The strength of the cleaning solution can be varied by a turn of the solution valve. Closing the valve enables the user to rinse with plain steam. The Magnus steam gun is available in two models.

For further information write to the company, or use the Request Card at page 18. Circle No. 620.

Aluminum Accessories For Streets and Highways

■ A new booklet available on request describes five applications of Alcoa aluminum on streets and highways. The aluminum alloys used offer a combination of corrosion resistance and high ratio of strength to weight.

Bridges and roadway railings, highway signs and markers, lighting standards, chain-link fencing, and gratings are among products listed.

To obtain this literature write to the Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 658.

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Send us 12-page catalog on 16-S Dandie concrete mixer

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C E CKM336

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CONCRETE • PLASTER-MORTAR • BITUMINOUS MIXERS • MOTO-BUGGY (power wheelbarrow)
(3½-16-S) (3, 6, 10-P) (10-14 cu. ft.)

Gear-Driven Trencher Mounted on Jeep

■ A new development in trenching equipment is a gear-driven trencher with gears running in oil, announced by Auburn Machine Works, Inc., Auburn, Nebr. The trencher will make a cut from 6 to 14 inches wide and down to 10 feet deep. Mounted on a Jeep, the unit is highly mobile and maneuverable. Estimated digging speed is 800 feet per hour.

The trenching mechanism is mounted well forward over the frame of the Jeep body. This places more weight on the front wheels, making for better traction, straighter trenches, improved steering and roadability between jobs, and less stress on the frame.

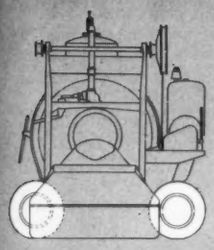
Engine power is transmitted through a new gear drive connected to the Jeep power takeoff, supplying power to the digging ladder. This compact drive, running in oil, replaces a multitude of exposed sprockets and chains. A hydraulic drive provides the Gear-Draulic model with a forward speed infinitely variable from zero to fully engaged. The boom is raised and lowered hydraulically to any position in a 190-degree arc of travel. Four levers control the trencher in operation.

An interesting feature of the Jeep-A-Trench Gear-Draulic unit is that lubrication of the five major bearings has been centralized with fittings beside the control levers.

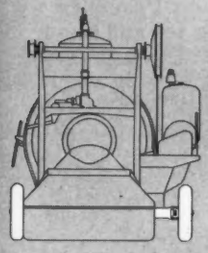
For further information write to the company, or use the Request Card at page 18. Circle No. 584.

In the Jeep-A-Trench machine, engine power is transmitted through a new gear drive connected to the Jeep power takeoff.

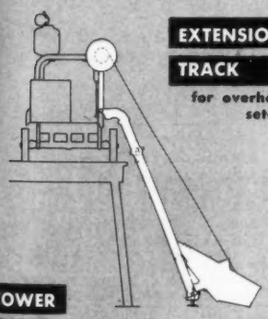
BIG enough for central mix plant jobs



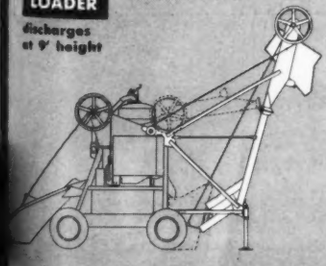
INTERCHANGEABLE SIDE OR END DISCHARGE
readily adapts mixer to suit operating conditions



EXTENSION TRACK
for overhead set-up



TOWER LOADER
discharges at 9' height



310 Trenchliner® digs 17 feet deep

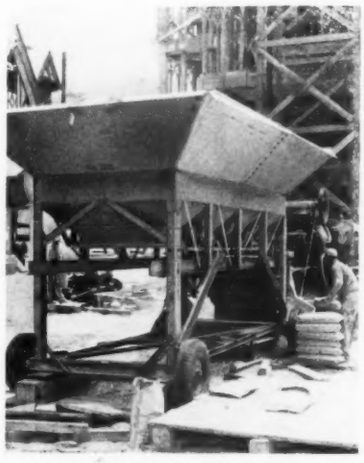
With 45 digging feeds, this big-capacity 310 Trenchliner produces from 8" to 15½' of clean, smooth-walled trench per minute . . . digs 1½ to 4½' wide at 17' depth with single boom, and up to 6' wide at 12' depth with dual booms. 310 has full reverse of all operations for undercutting or making vertical set-ins . . . is equipped with easy-in, easy-out "Tap-In" teeth. Parsons line also includes 5 Trenchliners in smaller sizes.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

Easy-charging Lo-Bin® Batcher

Lo-Bin Trolley Batcher holds 8, 20 or 30 tons . . . is only 7½' to 9½' high for charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weigh beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Lo-Bin is quickly dismantled, easily moved by dump truck. Optional: wheels, tires, tow-bar.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)



86.7 batches per hour with 34-E *twinbatch*®

Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E *twinbatch*. Also check rubber-tired 16-E.

KOEHRING Company
Milwaukee 16, Wis.

267

Concrete Strain Gage

■ A new embedment-type strain gage for concrete is announced by Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa. The Baldwin SR-4 Valore-type concrete embedment strain gage incorporates an SR-4 resistance wire strain gage with an effective length of 3 inches.

Two types of gage are announced. One is self-temperature-compensated for mild steel over the range of zero to 100 degrees F, to correspond with the average coefficient of expansion of concrete. The other gage is not so compensated. Both have a gage factor of 2 and a resistance of 300 ohms.

For further information write to the company, or use the Request Card at page 18. Circle No. 523.

Blueprint Drawing Pencils

■ Special tracing and drawing pencils suitable for blueprint work are covered in a leaflet from J. S. Staedtler, Inc., 25 Dicarolis Court, Hackensack, N. J. The literature describes a complete selection of Mars-Lumograph pencils, including 19 grades that range from a hard precise grey to a soft black. The harder degrees from F through 9H are designed for drafting, while the HB to 6B grades are softer drawing pencils. Special non-graphitic jet black leads for layout work are offered in the E × B and E × E × B degrees.

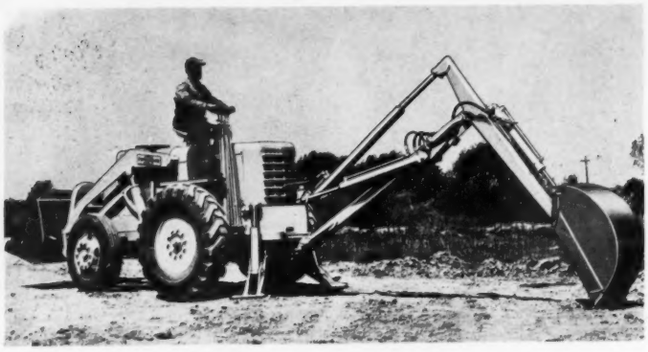
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 560.

Preserving and Restoring Masonry Structures

■ The services of specialists in the preservation and restoration of masonry structures are described in a booklet offered to contractors. The booklet is available from the Penetryn System, Inc., 2294 Scranton Road, Cleveland 13, Ohio. The company operates as an engineering, research, and construction organization in this specialized field.

A number of typical jobs handled are described in some detail. These include operations on buildings, foundations, walls, bridges, dams, piers, reservoirs, and tunnels.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 634.



The new Wain-Roy backhoe for Hough Payloaders.

Wrist-Action Backhoe for Tractor Loaders

■ Digging power and fast retracting action are features of its new backhoe for Hough Payloaders, according to the Wain-Roy Corp., Hubbardston, Mass. The hydraulically-powered attachment features a "wrist action" bucket that speeds up digging. The reason for this is that the hoe does not have to go through the complete cycle on all digging operations.

The boom design and bucket action permit digging vertical bell holes, vertical side walls, and square corners while maintaining a smooth, level grade at the bottom of trenches. Effective digging depth is up to 12 feet 6 inches below grade.

The ability to dig a trench and dump the spoil at any radius up to 190 degrees enables the unit to reach hard-to-get-at-spots. The hoe itself does not interfere with the normal Payloader functions, such as back-filling, and excavating. It may be easily removed in a half hour and attaches in less than an hour.

The Wain-Roy backhoe is now available for Payloader Models HE and HF and will be offered for other models in the near future.

For futher information write to the company, or use the Request Card at page 18. Circle No. 574.

Safety Hats and Caps Made of Glass Fiber

■ Safety hats and caps made of a light glass-fiber material are being marketed by Jackson Products, Inc., Warren, Mich. The new line includes a 14-ounce full-rimmed hat and a 12-ounce cap with visor only. Both are available in grey, white, yellow, green, and brown. In addition, a combination safety cap and arc-welding helmet is offered with either fixed or lift-front lens holder.

This Jackson combination safety cap and welder's helmet has a lift-up feature that lets the operator inspect his work without raising the entire helmet.

The headband is of extruded plastic with a replaceable, cork-lined sweatband, said to hold its shape well and to give a firm fit. Straps of webbing form the usual cradle on top of the head.

For further information write to the company, or use the Request Card at page 18. Circle No. 606.

Literature on Pellets For Melting Ice and Snow

■ Information on its X-73 chemical pellets for ice and snow removal is given in a catalog from the Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio. The new literature describes application methods and expected results, emphasizing particularly the importance of Phosite, a rust inhibitor and heat-retaining agent.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 632.

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DRAGS **PECKERWOOD** DRAGS
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MADE IN ANY C-O-N-T-I-N-U-O-U-S LENGTH UP TO 12 FEET
WIDTH 6 INCHES—IT'S DIFFERENT
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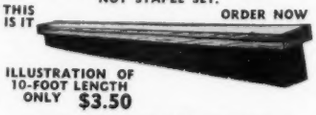

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RUNNING FOOT F.O.B. KC., MO.
NOTICE! Our 15" length Unit Drag 3" wide with the two bolts that fits your frame, still $2.50 ea.

SINCE **VAN BRUSH MFG. CO.** 1928
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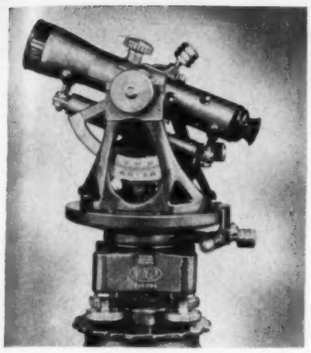


The new Brunson Model 65 transit-level.

New Transit-Level

■ A builders' transit-level said to have many advantages usually associated with more costly engineers' transits is announced by Charles Bruning Co., Inc., 4700 Montrose Ave., Chicago 41, Ill.

The new instrument features a dustproof ball-bearing center and a telescope axis, sealed in with a special silicone grease that needs repacking about once every twenty years. Size variations of the balls do not exceed half a wave length of light, and the balls are preloaded in races of comparable accuracy under approximately 100 psi to insure a permanent fit.

The Brunson 65 transit-level operates freely at temperatures ranging from minus 70 degrees to plus 160 degrees F. The 8-inch 20-power telescope tilts to 42 degrees up or down. Cross wires are Fiberglas, with internal focus precisely collimated from three feet to infinity.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 553.

Mobile Installations Of Electric Generators

■ A number of interesting mobile installations of electric generating plants are described in a special issue of *Power Points Digest*, company publication of D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis 14, Minn.

Applications of interest to contractors include a truck-mounted 750-watt plant for powering electric drills and an installation supplying power to a house trailer.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 577.

SASGEN
New Electric-Powered CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom.

Single line cap. 300# @ 100 feet per minute

Double line cap. 600# @ 50 feet per minute

The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Illinois

Burners for Firing Sand and Stone Dryers

■ Its Series 480P burners for firing rotary sand and stone dryers and rotary calcining kilns are covered in a booklet from the Hauck Mfg. Co., 124-136 10th St., Brooklyn 15, N. Y. The burners, which consume oil or a combination of gas and oil using low-pressure air, are reported to provide superior distribution and transfer of heat. Dryer capacities with these units are at 165, 145 and 134 tons per hour, according to the company.

The literature discusses operating features and lists specifications, including capacities and dimensions of the burners.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 659.

SAFE STORAGE of explosives, blasting caps, and other construction materials and equipment on the job site is the purpose of this portable welded-steel container. The 275-cubic-foot-capacity Transportainer, developed by Dravo Corp., Neville Island, Pittsburgh 25, Pa., is weatherproof. Outside dimensions are 7 feet 9 inches long, 6 feet 5 inches wide, and 6 feet 10 inches high. For further information write to the company, or use the Request Card at page 18. Circle No. 627.

Cedarapids
Built by IOWA

MASTER BITUMINOUS MIXING PLANTS GIVE YOU

BIG-VOLUME OUTPUT TO LICK TIGHT SCHEDULES

The twin-shaft mixing unit of the two-unit Master Plant enables you to meet, *and profit*, by today's high speed operations and the demand for big volumes of mixes which meet exacting specifications. This self-contained, highly portable unit will handle a continuous flow of volumetrically proportioned aggregate . . . either a single aggregate or a blend of sizes . . . and a constant flow of accurately controlled bitumen to produce 200 or more tons per hour of extremely uniform bituminous mixture.

ACCURATE GRADATION TO MEET THE MOST EXACTING SPECIFICATIONS

When accurately proportioned blends of two to four sizes of aggregates are required, the Master Plant's gradation control unit assures your meeting the strictest specifications for continuous-flow type mixes. It is perfectly balanced to give the utmost in production at the lowest possible cost. Optional equipment includes a fines feeder, bulk mineral filler handling equipment and overflow return conveyor. Both mixing unit and gradation unit of the Master Plant are quality-built throughout to insure low maintenance costs.

Commander Crushing and Screening Plant

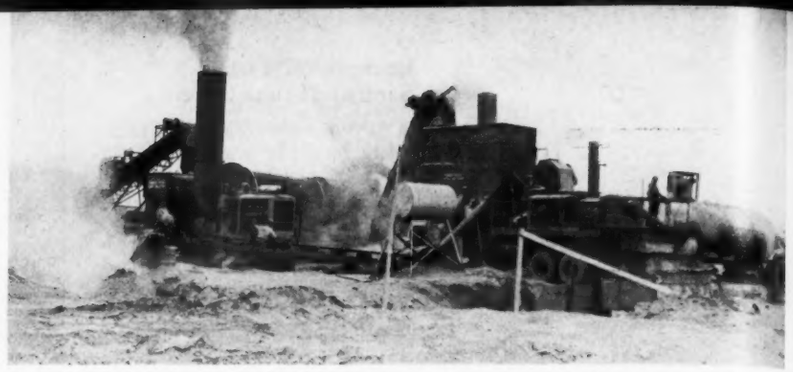
Motorized Head Pulley

Vibratory Soil Compactor

Model G-60 6000-lb. Bituminous Mixing Plant

Tar-Rubber Mix Used To Pave Jet Air Base

Selected to resist jet fuel dilution on 105,000-square-yard paving contract; experimental plant-mix laid with finisher



This Pioneer 101 Continuflo hot plant processed the special tar-rubber mix used to resurface parking area and taxiways at Williams Air Force Base. *Ray Day Photos*

ONE OF THE FIRST western experimental uses of tar-rubber as an airport paving mix has recently been made at Williams Air Force Base near Chandler, Ariz., where a total of 105,000 square yards of parking area and taxiway has been re-worked. B. L. Gustafson, Phoenix contractor, did the job under a $200,000 contract with the Los Angeles office of the U. S. Army Corps of Engineers.

Tar-rubber was picked by Corps of Engineers designers, instead of conventional asphalt or portland-cement concrete, because of its unique ability to resist jet fuel dilution. Five other installations of the material have been made recently on military airfields in the United States. While the new paving is still experimental, a sizeable section has been tested thoroughly at the U. S. Waterways Experiment Station at Vicksburg, Miss. These tests indicate that tar-rubber hot-mix is competitive to portland-cement concrete.

Williams AFB is an air force auxiliary training field. Built several years ago under Corps of Engineers contracts, typical sections underneath Gustafson's work area consisted of 9 inches of improved base, 6 inches of aggregate base course, and 3 inches of asphaltic-concrete pavement laid in 1951. This pavement failed rapidly, and a hot sand-asphalt seal coat was placed a year later. Pavement failures continued, however, so that the recently completed contract called for removal of about 200 square yards of failed pavement area prior to the installation of the tar-rubber paving.

The evolution of tar-rubber as an airfield paving material has been a case of the old adage, "Necessity is the mother of invention." Its need was urgent when the jet age was born. In the old days of propeller-driven aircraft, high-octane aviation gasoline evaporated quickly, doing little or no damage to conventional asphalt or concrete pavements when it was spilled. But jet fuels, because of certain aromatic ingredients, have exceptionally slow evaporation rates. They are particularly destructive to asphalt pavements.

Tar-rubber was developed as a result of the pressing need for producing a pavement substantially less costly than portland-cement concrete, but which would perform equally well in critical areas. Naturally, the first jobs are running high. Gustafson's contract called for only 105,000 square yards of tar-rubber pavement 1½ inches thick, plus a few minor items like rehabilitation of the old asphalt pavement and certain tack-coat work. The contract was $200,000.

Started late in March of this year, the job was finished four months later.

Old Pavement Repaired

First operations centered around the repair of 200 square yards of damaged asphalt pavement, and the removal of the old sand-asphalt seal

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★ **SAFE:** Up to 50% more reserve pulling and holding power than ratings indicate.

★ **STRONG:** Engineered for ruggedness. All moving parts, such as worm gears, made of steel and bronze alloy.

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Specifications and procedures on new Abrasoweld and Faceweld are in Lincoln Weldirectory on Hardsurfacing. Write for Bulletin 466.

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THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT
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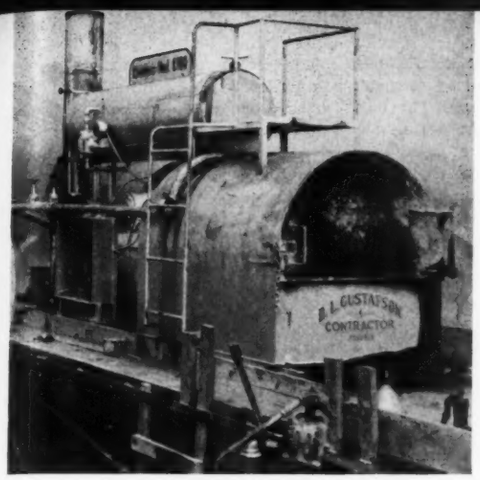

Heat for the asphalt tank coils, insulation, and the pugmill jacketing was supplied by the Childers C-100 automatic steam generator shown above.

which had been placed in 1952. The seal came loose rapidly and with ease when it was tight-bladed by a motor grader. A special shop-built blade, mounted on a Fordson tractor, also was used for this work. After the asphalt surface was power-broomed and the old seal had been loaded and hauled, most of the area was ready for the tar-rubber application.

In certain areas, where extensive damage had been done to the old asphaltic concrete, the material was dug out by motor graders and, if necessary, the base course material also was removed and replaced to original standards. These sections were built up to grade lines within reach of the tar-rubber paving material.

Hot-Plant Setup

The hot-plant setup for the work was made on a 13-mile dead haul in a Queen Creek tributary wash where excellent aggregates could be obtained. Contractor Gustafson owns a Pioneer 101 Continuflo hot plant, and performance of this plant on asphalt had previously been clocked at 200 tons per hour in aggregates with a moisture content of 6 to 7 per cent. He moved this plant in close to the nearby rock production setup and did the paving on a single plant setup.

For aggregate production, Gustafson used a Cedarapids Junior Tandem rock plant containing a set of 15 × 20 roll crushers and a 2036 jaw. The raw aggregate from the pit was fed to the machine by a Caterpillar-mounted U-dozer, and finished aggregates were trucked over to the stockpiles at the Pioneer hot plant. Stored in divisions of coarse and fine material, along with a pile of auxiliary blend sand, these materials were graded as follows:

Screen Size	Per Cent Passing		
	Coarse	Fine	Sand
¾ in.	100		
½ in.	81		
⅜ in.	54	100	
No. 4	16	98	
No. 10	9	73	100
No. 20	6	52	98
No. 40	4	36	81
No. 80	2	20	18
No. 200	1	12	5

The mix was made up of 40 per cent coarse aggregate, 50 per cent fine material, and 10 per cent blended sand.

The Pioneer hot plant was a stock model machine, electrically driven by a General Motors diesel-electric generating set of 300-hp capacity. In the only direct diesel drive, the pugmill paddles were driven by a 130-hp General Motors diesel engine. Auxiliary equipment around the plant included a Bucyrus-Erie 22-B crawler-mounted crane with a ¾-yard clamshell bucket for charging the bins, an auxiliary special blower to remove fumes from the pugmill operator's platform, a 10-kw Onan electric light plant for night operations, and a Childers C-100 steam generator which supplied heat for asphalt tank coils.

(*Continued on next page*)

A Barber-Greene finisher spreads the mix as it is dumped from the 18-ton batch truck. A Buffalo-Springfield steel-wheel roller follows.

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- **Sectional Plate Pipe, Arches and Pipe-Arches of *any size or radius***
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- **Controlled Hot Dip Galvanized Sectional Plate**

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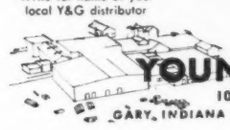
Fabricated from copper-bearing steel or pure iron. Corrugated, formed, hot dip galvanized or coated in Y&G plants to your specifications or drawings.

All Sectional Plate Culverts or Arches are test assembled at the Y&G plant—come with bolt holes accurately matched, with plages individually numbered to correspond with numbered erection drawings . . . are easily and quickly assembled.

Extensive facilities and modern methods speed delivery. Central location lowers freight.



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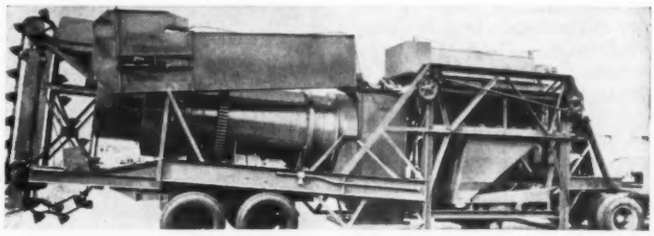

HAUL IT *Anywhere!* Perfect for rural areas . . . for hard-to-reach locations, for state highways and county and township roads. Truck tractor hauls plant easily. Now you can profitably handle jobs that size and distance formerly eliminated or made extremely expensive.

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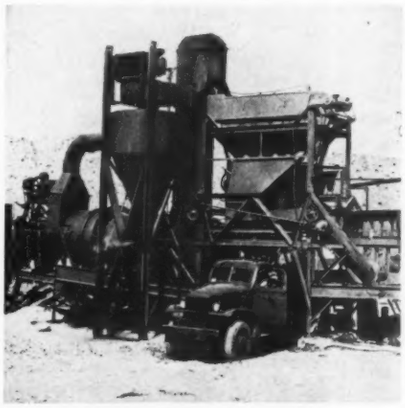

The push button operated "Self-Lift" *automatically* raises or lowers the mixing section in minutes. The entire unit, including cold and hot elevator, can be put in working position in as little as 2½ hours. Estimated erection or dismantling time for complete plant, including boiler and storage tank, is approximately one day. Built for years of the most rugged service, the STANDARD portable plant will stand up under both heavy asphalt production and the added stress and strain of constant erection, dismantling and road shock.

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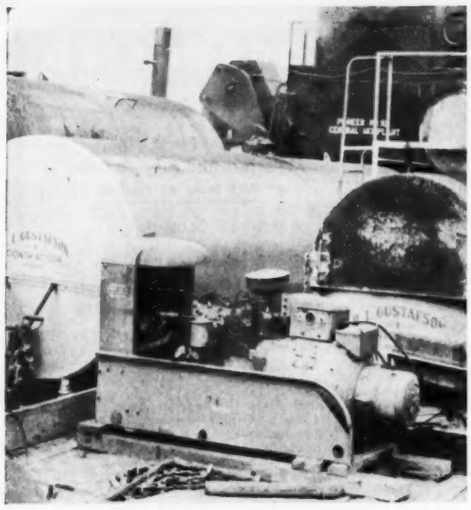
STANDARD 52 YEARS 1902 1954

STANDARD STEEL CORPORATION

5007 Boyle Ave., Los Angeles 58 • 15 Park Row, N. Y. 38



With operations in the plant area often continuing after dark, contractor B. L. Gustafson used this Onan generating plant to provide power for illumination.

Ray Day Photo

mix asphalt, gave off acrid fumes which were aggravated by Arizona's midsummer temperatures. The only way to keep the Barber-Greene laydown machine clean after a day's work—and this was also true at the hot plant—was to clean the settled material off with creosote. In spite of these operating difficulties, the crew managed to set average hourly production rates of 160 tons per hour, occasionally hitting the 170 mark.

Otherwise, the laydown work followed conventional lines for routine hot-mix materials. A Barber-Greene finisher was used for the distribution of material in 12-foot lanes. The material was laid over the old asphaltic concrete pavement after a fog coat of 0.5 gallon of RS1 emulsion had been applied for a tack coat. Rolling was a job for a Buffalo-Springfield steel-wheel machine. As an added measure to increase surface texture and density, a Tampo SP9 self-propelled pneumatic-tire roller also was used.

For the time being, the tar-rubber pavement will be used without a seal coat, since Arizona's summer and winter weather is not too extreme. Other installations of the material are reported to be in excellent shape, undisturbed by normal use by jet aircraft, and Corps of Engineers officials expect good performance from this job. A similar installation, made recently at Davis-Monthan Air Force Base in Tucson, is standing up well.

Personnel

Corps of Engineers activities at Williams were under the general supervision of Col. Arthur H. Frye, district engineer, with William J. Leen

(Continued from preceding page)

insulation, and the pugmill jacketing.

Because the hauling and handling of the tar-rubber preparation was so important and yet so full of unknowns, Gustafson farmed that job out to Arizona Refinery Co., a local firm skilled in handling petroleum products. Approximately half the tar-rubber preparation was Flintbinder C2, a product of the industrial products division of The Flintkote Co. The remaining bitumen was Surfa-Aero-Sealz, manufactured by U. S. Rubber Co.

This material was shipped to a railroad unloading point at the refinery in Phoenix, heated by tank car heaters to pumping temperatures, and trucked to Chandler. At the Pioneer hot plant, Gustafson used a 12,000-gallon asphalt tank for the storage of this material. There were also a 6,000-allon tank for burner oil and a 500-gallon storage tank for light-plant fuel.

Precise standards were used in mixing the tar-rubber material. General design specifications had been built around 200-psi tire pressures. Other design criteria included a Marshall stability of 1,000 pounds or higher, a flow of 10 or lower, a percentage of voids in relation to total mix of from 3 to 5, and from 75 to 82 per cent of voids filled with binder material.

Bin percentages were controlled as follows:

Grade	Per Cent of Total Aggregate
Coarse (¾ in. to ⅜ in.)	25
Intermediate (⅜ in. to No. 6)	20
Fine (No. 6 to No. 200)	55

Bin gradations at the hot plant:

Screen Size	Coarse	Intermediate	Fine	Ideal Gradation
¾ in.	100			100
½ in.	81			93
⅜ in.	28	100		81
No. 4	6	43	100	64
No. 10	4	9	85	50
No. 20	3	6	66	37
No. 40	2	4	48	27
No. 80		2	23	13
No. 200			11	4.5

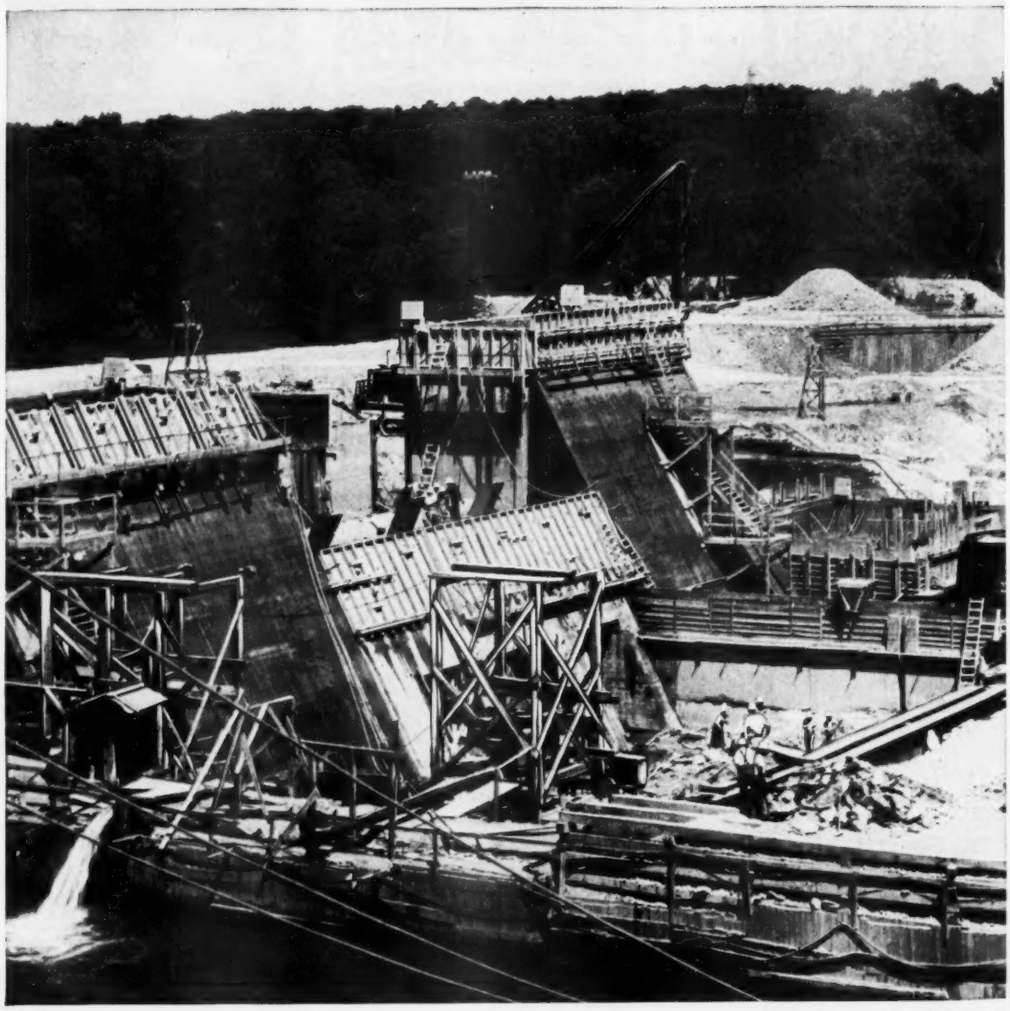
Tolerance was plus or minus 4 per cent for ½ inch through No. 4, and plus or minus 3 per cent for No. 10 through No. 200.

Laydown Work

Of special interest to men in the field was the laydown of material at the parking area and taxiway sites. The tar-rubber mix, while it tended to lay as easily or easier than hot-

On VEPCO'S Roanoke Rapids, N. C.

it's SHELL.*



Pneumatic rolling by this Tampo SP9 self-propelled rig improves both density and surface texture of the experimental pavement.

Ray Day Photo

as operations chief. Field forces were under the direction of W. S. Alldredge, with Gene T. Ankrom as project engineer, I. R. Byrum as paving engineer and E. T. Koski, Guy Timmnan, Vern Fischer, and Gus Fennerty on laydown and batch-plant inspection.

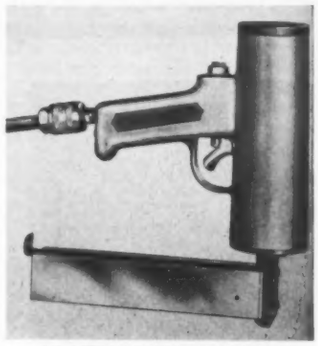
B. L. Gustafson supervised his own contract work personally, assisted by Chester Cooper, superintendent, and C. L. Blackwell, hot-plant foreman.

THE END

Air-Operated Stapler Does Many Nailing Jobs

■ Many nailing jobs can be done faster with the Calwire air-operated stapler made by California Wire Products Co., Inc., 326 N. E. Third Ave., Visalia, Calif. The 6-pound aluminum-constructed stapler drives through plywood panels and most woods, including oak.

Offered in models for staples up to 1¼-inch long and as wide as one inch, the stapler is recommended for



The Calwire air-operated stapler.

lining forms and for other construction jobs. The magazine holds 104 staples. Air requirements are 100 to 125 psi.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 617.

Two New Transmissions For Extra Truck Power

■ Two new auxiliary transmissions have been added to the Truckstell Mfg. Co.'s line of special truck equipment.

The first auxiliary is a 2-speed model for trucks that have adequate gear splits, but need greater pulling power for climbing steep grades or for off-highway operation. This lightweight model provides an underdrive ratio of 2.18 to 1, more than doubling the pulling power in compound low. It is suitable for trucks with gas engine displacement of up to 265 cubic inches.

The other new Truckstell auxiliary is a 3-speed model designed to meet the need for extra power gears and gear splits in all popular-size trucks. Optional ratio combinations are available, as well as a built-in, full-engine-torque, variable-speed power takeoff. This auxiliary is built for trucks with gas engines of up to 400-cubic-inch displacement.

For further information write to the Truckstell Mfg. Co., Union Commerce Bldg., Cleveland 15, Ohio, or use the Request Card at page 18. Circle No. 604.

One-Man Manual Hoist

■ A manually operated hoisting or pulling device rated at 3,300 pounds on a single line is illustrated in literature from Griphoist, Inc., 700 Polk St., San Francisco 9, Calif. The Tirfor Griphoist uses wire rope of ½-inch diameter, that passes through the machine in a straight line so that an unlimited length may be used. With a two-part line, the device handles 3 tons; with multiple sheaves, it will hold 6 to 10 tons.

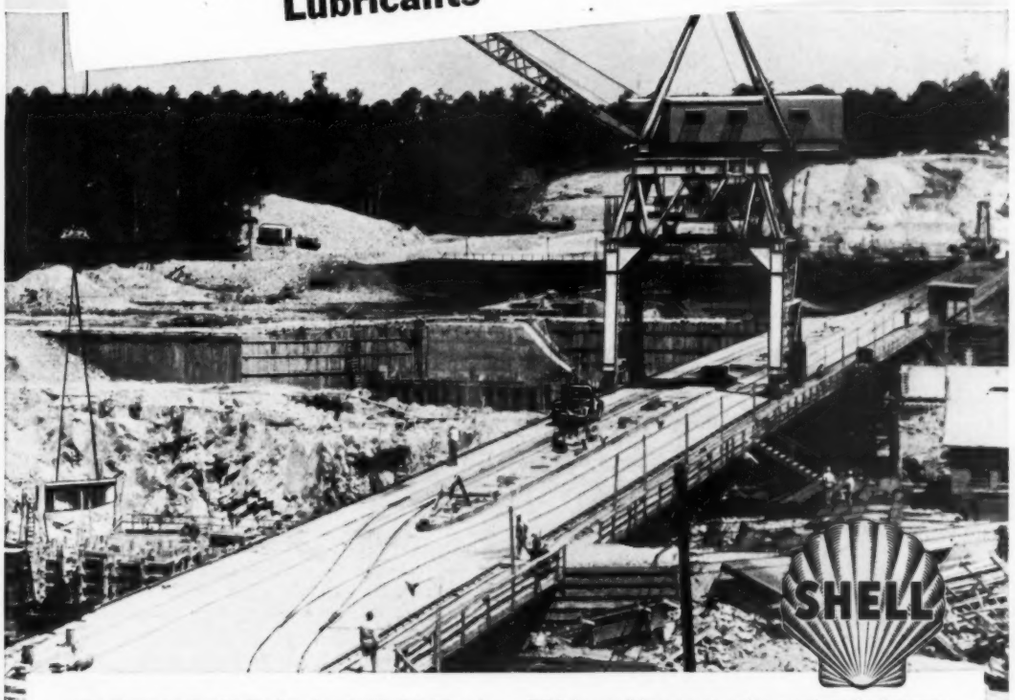
The hoist works on the draw vise system, lifting and lowering loads by two pairs of jaws that seize and draw the wire rope through the apparatus. Weighing 42 pounds, the hoist is carried and operated by one man and works in any position.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 661.

Hydroelectric project . . .

Gasoline
Fuel Oil
Diesel Fuel
Kerosene
Industrial Lubricants

Solvents
Motor Oils
Anti-Freeze
Greases
Outboard Motor Oil



The Roanoke Rapids Project for the Virginia Electric and Power Company, being constructed by Stone & Webster Engineering Corporation, is going full speed ahead. This extensive job keeps hundreds of pieces of heavy construction equipment busy, day and night. Nearly 100% of this equipment relies on Shell Industrial Lubricants and Fuels to meet the rigorous operating conditions.

When completed, Roanoke Rapids project will supply 100,000 kilowatts of electricity for Vepco's system.

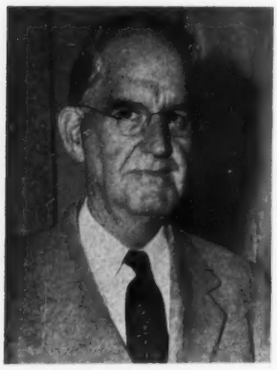
Widely used in construction work and wherever heavy duty equipment operates, Shell lubricants protect machinery and at the same time keep maintenance costs at rock bottom. Perhaps it will pay *you* to look into the savings of a 100% Shell program.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.

*A diligent search could uncover only one piece of Vepco's equipment NOT using a Shell product.

NAMES IN THE NEWS



W. R. Glidden, newly elected president of the American Society of Civil Engineers.

Elect W. R. Glidden President of ASCE

Balloting by the more than 37,000 members of the American Society of Civil Engineers has resulted in the election of William R. Glidden, of Richmond, Va., as president. Mr. Glidden, the assistant chief engineer of the Virginia State Department of Highways, took office October 20.

At the same time, two vice presidents and six new directors were elected. Frank L. Weaver of Washington, D. C., and Louis R. Howson of Chicago, Ill., will serve as vice presidents. The directors are Don M. Corbett, Washington, D. C.; Lawrence A. Elsner, San Francisco, Calif.; Jewell M. Garrelts, New York, N. Y.; Frederick H. Paulson, Providence, R. I.; George S. Richardson, Pittsburgh, Pa.; and Graham P. Willoughby, Birmingham, Ala.

AGC of Minnesota Names Mullen as Consultant

John H. Mullen, who retired from contracting earlier this year, has been made a full-time consultant on the staff of the Associated General Contractors of Minnesota, Inc., Minneapolis. He was formerly president of Nelson, Mullen & Nelson, Inc., of Minneapolis.

Until 1925, Mr. Mullen was associated with the Minnesota Department of Highways, serving as deputy state engineer for roads, deputy highway commissioner, and chief engineer.

He has been president of the St. Paul Engineers Society, the Mississippi Valley Association of State Highway Officials, and the AGC of Minnesota, and secretary of the American Association of State Highway Officials.

Myers Joins Blitz, Inc.

Entering the Joseph P. Blitz, Inc., general contracting firm of New York, N. Y., as project manager is Jack Myers.

Formerly with Hegeman-Harris Co., Mr. Myers has worked on such projects as the new Hippodrome Building; Culver Memorial Chapel at Culver Military Academy, Indiana; and at Colby College, Maine.

Gen. Lucius Clay Heads Highway Study Committee

Gen. Lucius D. Clay (Ret.), under whose orders the famous Berlin airlift was carried out, has been appointed to head a special advisory committee to study state and federal problems connected with putting President Eisenhower's $50 billion highway improvement bill into effect.

The committee, whose members were chosen from organized labor, banking, and construction fields, includes William A. Roberts, president of Allis-Chalmers Mfg. Co., Milwaukee, Wis.; S. Sloan Colt, president of the Bankers Trust Co., New York, N. Y.; Stephen D. Bechtel, San Francisco, Calif., construction executive; and David Beck, president of the AFL International Brotherhood of Teamsters. Directly appointed by the President, the committee will report to him before the next session of Congress.

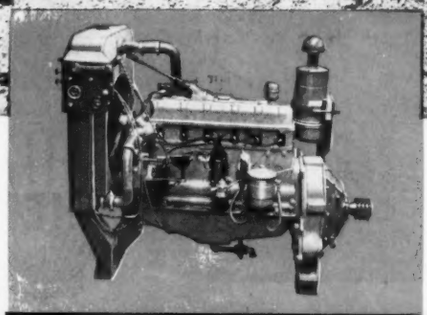
The resources of the Bureau of the Budget and the Bureau of Public Roads will be at the disposal of the committee, and the members will work closely with the Governors' Conference committee and the Cabinet Committee on Transportation Policy and Reorganization, both of which are studying different phases of the same problem.

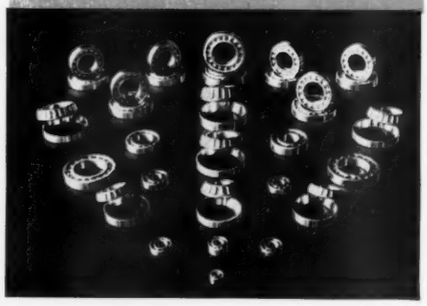
Wisconsin Highway Body Makes Personnel Changes

Three major changes in the staff of the Wisconsin State Highway Commission have been made. Albert T. Bleck was named to the newly created position of assistant state highway engineer. The former engineer of construction supervision, Stratton E. Hicks, succeeds him as engineer of construction.

William F. Steuber has been transferred from the engineering division to the administrative division to become chief of public information. He will be responsible for disseminating information concerning the commission's policy, programs, and projects.

Five district engineers have been appointed as replacements for men who will retire this year. At Lancaster, Elroy H. Hinkley, assistant





Heaped loads like this are the rule with Bucyrus-Erie excavators because full power is put to work at the dipper — none is wasted swinging useless deadweight.

Power Is Right To Begin With because power unit has operating characteristics designed to meet the needs of excavating and lifting service, and is matched to the rated capacity of the machine in which it is used. Special "tailoring" of the engine provides better fuel and air mixture for increased efficiency . . . less pulldown under sudden loads . . . more lugging power at slower speeds . . . ability to regain speed quickly after slow-downs.

Power Rides To Work Efficiently with minimum loss from friction and inertia. Most power-transmitting parts used in the digging cycle ride on anti-friction bearings. Fewer actual parts are used — power flow is free and direct.

district engineer, will succeed Thomas W. Reilly. Mr. Reilly has held the post since 1921. Thomas M. Reynolds, district engineer at La Crosse since 1920, will hand over his duties to Vere L. Fiedler, assistant engineer of maintenance in Madison.

Edwin R. Holm, assistant at Eau Claire, will succeed William F. Baumgartner, district engineer since 1925. At Superior, Richard C. Clark, assistant at La Crosse, will take the post held by Garth I. Germond since 1929. Henry Winat, assistant district engineer at Rhinelander, will succeed Steven A. Koszarek, district engineer there since 1931.

Harris Personnel Changes

A series of executive promotions at Frederic R. Harris, Inc., consulting engineers, New York, N. Y., took place recently. Eugene H. Harlow, formerly a vice president, has been named executive vice president of the firm. C. J. Murphy has been elected vice president, and H. B. Sanford, a vice president, will also serve as treasurer.

Executive Vice President Elected by Fruin-Colnon

With his election as executive vice president of Fruin-Colnon Contracting Co., St. Louis, Mo., John P. Soult assumed the management of the company. Previous to his election, Mr. Soult was vice president of the firm.

Others elected vice pesidents of the company are F. C. Ahrens, service division; Oliver A. Ray, heavy division; A. A. Pierson, Indianapolis division; and Clyde E. Nelson, building-construction division of the metropolitan St. Louis area. Aside from the election of Paul R. Jacobs as secretary-treasurer, all other officers of Fruin-Colnon were re-elected.

ACI Appoints New Technical Director

In an effort to expand its services, the American Concrete Institute has appointed Paul F. Rice to the post of technical director. He will be responsible for promoting and improving technical relations with other societies and organizations, assisting member groups in organizing and conducting meetings, and aiding technical committees in the preparation of reports.

A civil engineering graduate of North Dakota State College, Mr. Rice was most recently a field engineer for Portland Cement Association.

F. H. McGraw President Aids North Church Drive

Clifford S. Strike, president of F. H. McGraw & Co., New York, N. Y., has been appointed to the advisory committee of an American industry group currently raising funds to restore Boston's famed North Church steeple, which was destroyed by Hurricane Carol.

The group, headed by Charles J. Hardy, Jr., chairman of ACF Industries, estimates that about $200,000 will be required to rebuild the landmark. As a member of the Old North Steeple Restoration Fund advisory committee, Mr. Strike will assist in securing help from industrial firms and insurance companies to rebuild the steeple.

Saurbrey Is Named To Executive Post

In an election held recently at the Mellon-Stewart Co., Pittsburgh, Pa., contracting engineering firm, H. A. Saurbrey was named to the newly created post of executive vice president.

Vice president of the company since 1949, he has been in the construction

H. A. Saurbrey, new executive vice president of Mellon-Stewart Co., Pittsburgh.

field since his graduation from Polyteknisk Laeanstalt, Denmark, fifty years ago.

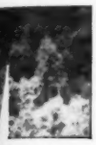
Mr. Saurbrey is the author of several engineering textbooks, and a member of the Pennsylvania Society of Professional Engineers, the Engineers Society of Western Pennsylvania, the Society of American Military Engineers, and the American Society of Civil Engineers.

Military Engineer Joins Staff of Kaiser Division

Col. H. George Gerdes (Ret.), formerly with the U. S. Army Corps of Engineers, has been appointed power engineer for Kaiser Engineers, division of Henry J. Kaiser Co., Oakland, Calif. He will be assigned to the engineering firm's hydroelectric power development program.

Most recently a member of the staff and faculty at the Army Engineer School, Fort Belvoir, Va., Col. Gerdes has had more than 20 years' experience in civil and military engineering. He was engineer in charge of design on the Bonneville Dam in Oregon and principal assistant on the design and construction of the Santee Cooper power project in South Carolina.

During World War II he served on various construction projects for the armed forces.



HOW BUCYRUS-ERIE INDIVIDUAL DESIGN HELPS

put more of your excavator power to work

When the maximum of your excavator's rated engine horsepower goes to work you get many advantages — most effective digging, fast work cycles, real fuel economy, and high overall output.

With Bucyrus-Erie's Individual Design of each model in the line you are sure that for every machine: (1) the power plant is carefully selected to handle the rated capacity; (2) power flows freely through efficient machinery designed for that model alone; (3) the machine is engineered with plenty of strength but without deadweight that accompanies under-powering one machine to make a "new" model.

Individual Design does more than get the most from power — it saves maintenance, lengthens excavator life, gives you more excavator for your money. Your Bucyrus-Erie distributor will give you the complete story on this outstanding line of ⅜- to 4-cu. yd. gasoline, diesel, and single motor electric excavators. 35E54C

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

No Power Is Wasted Swinging Deadweight because Individual Design tailors each part for its job on a particular model without adding useless weight. Strength is added and weight further reduced on main and truck frames with box-section design and internal reinforcing ribs. Dragline booms are of all-welded, lattice-type construction with no excess weight but strong enough to take compression and swing stresses. Shovel front ends combine light weight for faster swing with plenty of strength for tough digging.

See Your Bucyrus-Erie Distributor

SHOVELS • DRAGSHOVELS • DRAGLINES • CLAMSHELLS • CRANES •

Visqueen, a pliable waterproof plastic sheeting, is laid over sand to act as a moisture barrier in a building base. The sand is there to protect the material from sharp projections. Wire-mesh reinforcement and concrete, placed over the plastic sheets, complete the base. ►

Light, Pliable, Waterproof Plastic Sheets Make Easy-to-Use Building Vapor Barrier

■ Thin, tough sheets of a pliable plastic have been placed on the market as a versatile new building material. The plastic, called Visqueen, has the property of acting as a barrier to water penetration, and well exceeds the federal government's vapor barrier recommendation, according to the manufacturer. Available now in seamless easy-to-handle sheets up to 16 feet wide and from .002 to .020 inches thick, the lightweight material can be applied economically to exterior walls, over subflooring, underneath concrete slabs, or in a crawl space to control moisture. The plastic is also recommended as a form liner and as a cover for curing concrete. It is expected to find use also as a cover for material and equipment on the job site.

The plastic sheeting is made from Bakelite polyethylene resin manufactured by the Plastics Division of the Visking Corp., Terre Haute, Ind. Because this waterproof plastic is tear and puncture-resistant, it can be attached easily to studding by staples. Being chemically inert and containing no plasticizer to dry out, it should not deteriorate for the life of the structure, according to the manufacturer. The material is nonflammable.

One of the most important characteristics of the plastic, cost-wise, is its light weight. It is estimated that one man can carry enough of the material to meet the requirements of three average homes. Also, laying costs are reduced because the material is available in extra-wide sheets.

With these properties, the plastic sheeting is expected to find many construction uses. Applied to the warm-side wall of a building, Visqueen stops the passage of moisture to the cold side where condensation occurs. It will also act as a permanent barrier to air infiltration.

Under concrete slabs, the plastic film prevents moisture from passing through or into the concrete, eliminating the need for a gravel or stone base. Used in crawl spaces, it is laid on the ground and covered with a layer of sand to keep it in place. The plastic sheeting may also be applied over subflooring to keep moisture, dust, and air from coming through.

Placed in forms for foundation walls, Visqueen keeps moisture from passing through the walls. According to the manufacturer, no other waterproofing is needed. The material, incidentally, is the same plastic in which market vegetables are packaged to keep them moisture-fresh.

For further information write to the company, or use the Request Card at page 18. Circle No. 650.

Grouting Heavy Equipment With Non-Shrink Mortar

■ A folder describing grouting of heavy equipment with a non-shrink mortar is available from The Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio. It outlines and illustrates Embeco mortar, some common methods of grouting different types of equipment, the mixing and placing of grout, cold and hot-weather grouting, and the measurable characteristics of the product.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 662.

Track-Mounted Trailer

■ The track-mounted Athey Universal trailer is designed to haul heavy and bulky loads wherever a track-type tractor can travel. The trailer's construction, features, specifications, and applications are described in a new folder issued by Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill. Methods of converting the trailer for specific uses are illustrated in the booklet.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 540.

ONE MAN AND A Pit-Bull CAN DO HUNDREDS OF DIFFERENT JOBS... AT LESS COST

Save on equipment costs and better utilize your manpower. Invest in the Davis ***Pit-Bull***...a top-quality, hydraulically operated unit for Ford or Ferguson tractors that has eleven different attachments. You can keep the ***Pit-Bull*** and its operator busy all the time. Look at the jobs it will perform. Your initial investment is far less...and the cost of additional attachments is only a fraction of machines that do comparable work.

The ***Pit-Bull*** actually turns your Ford or Ferguson tractor into a powerful machine. A syncro-mesh transmission gives four speeds each direction, *plus* extra power for digging and loading. Notice how the operator sits high...out of the dirt...with perfect vision. Controls, steering and seating are reversed so he has absolute finger-tip control over the ***Pit-Bull*** and the tractor. Let a demonstration...and a look at the price...*convince you!*

LOOK AT THE ATTACHMENTS THAT FIT THE Pit-Bull

1. LOADER WITH OR WITHOUT SCARIFIER
2. BACK-HOE
3. TRENCHER
4. ROTARY BROOM
5. SWINGING CRANE
6. LIFT FORK
7. ROLLER
8. POST AUGER
9. DOZER
10. HAMMER
11. ROTARY MOWER

DAVIS PRODUCTS WICHITA KANSAS 1ST QUALITY VERSATILITY APPEARANCE REASONABLE

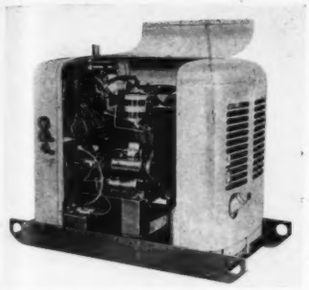
Write for this brochure on the Davis Pit-Bull and ask for the name of your nearest dealer He will arrange a demonstration for you

MID-WESTERN INDUSTRIES, INC.

1009 SOUTH WEST STREET Dept. B WICHITA, KANSAS

The Davis Pit-Bull Is Manufactured by the Makers of the Davis Loader, America's Quality Front-End Tractor Loader!

PB-6



A Willys Power Giant engine.

Engines Offered as Complete Power Units

■ Each of the four Power Giant industrial engines produced by Willys Motors, Inc., is now available as a complete power unit, equipped with a radiator, gas tank, air cleaner, electrical equipment, and governor. The unit is enclosed in a heavy-gage, steel housing and mounted on reinforced skids.

Engines available as power units include the 4-cycle, L-head Model L-4 Jeep designed for the lower power ranges. This engine develops 47.5 bhp maximum at 2,400 rpm and 59 bhp at 4,000 rpm. Also offered in the 4-cylinder class is the Willys Hurricane, Model F-4, an F-head engine that develops 51 maximum bhp at 2,400 rpm and 70 at 4,000 rpm.

In the 6-cylinder class, the L-head Model L-6 Lightning delivers 56 bhp at 2,400 rpm and 75.5 at 4,000. The Model F-6 Giant Hurricane, another F-head design, develops 60 maximum bhp at 2,400 rpm and 90 at 4,200 rpm. An important feature of both F-head engines is a torque curve which is practically constant at all speeds.

For further information write to the Industrial Engine Dept., Willys Motors, Inc., 1015 N. Cove Blvd., Toledo, Ohio, or use the Request Card at page 18. Circle No. 550.

New Bead Loosener For Earthmover Tires

■ A new bead loosener for the giant tires used on off-the-road equipment has been announced by Bishman Mfg. Co., Osseo, Minn. This tool exerts up to 10,000 pounds of pressure on the bead to break it away from the tapered bead seat rims used on earthmover wheels.

The Bishman Giant Model No. 924 bead loosener has a long arm that provides the leverage necessary to force the tapered steel fingers between the tire bead and rim flange. A screw, operated by a ratchet wrench or impact wrench, then breaks the bead away from the rim.

For further information write to the company, or use the Request Card at page 18. Circle No. 517.

Plaster and Mortar Mixers

■ Mixers for plaster, mortar, stucco, and Structolite are illustrated in a catalog from Knickerbocker Co., 620 Liberty St., Jackson, Mich. The folder describes the Knickerbocker No. 9 Master-Mixer for two-bag batches, and the No. 4 Mix-Miser with one-bag capacity.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 594.

Scraper Rings Protect Hydraulic Systems

■ Scraper rings that are installed on hydraulic piston rods to remove oil, mud, frost, ice, and other types of accumulation are made by Gadgets, Inc., of Dayton, Ohio. The Hydro-Wype scraper rings, manufactured to close tolerance, are suitable for installation on construction and highway-building machinery.

The rings are available in two series, the Standard, which is reported to provide adequate protection on many applications at a minimum cost, and the Series A which meets more exacting specifications. The manufacturer produces the rings for a wide range of piston-rod diameters, and maintains an engineering department to develop special sizes and adaptations to customers' specifications.

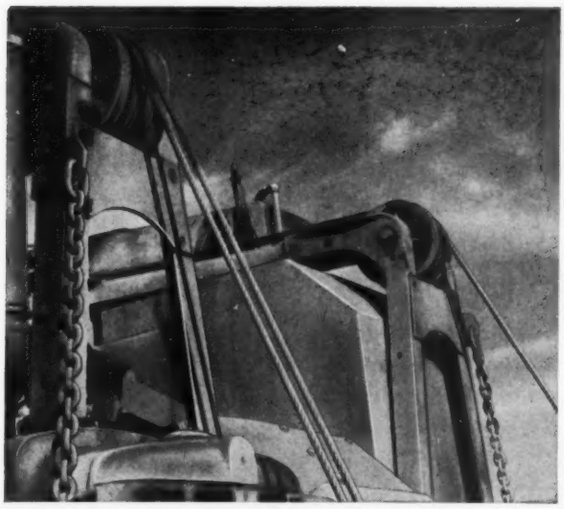
For further information write to Associated Technical Sales Co., P. O. Box 26, Riverdale Station, Dayton 5, Ohio, or use the Request Card at page 18. Circle No. 609.

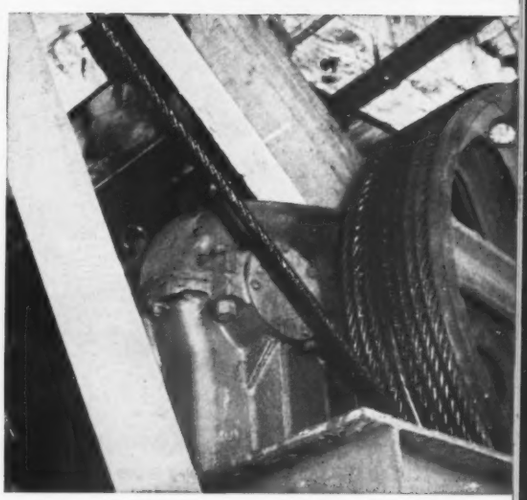
Data on Welding Electrode

■ A new brochure from Coast Metals, Inc., 201 Redneck Ave., Little Ferry, N. J., gives details on a thin-walled tube elecrode containing molybdenum, boron, and iron. Available now in $\frac{1}{4} \times 11$-inch coated electrodes, it will soon be available in $\frac{1}{8}$-inch electrodes and in coils for automatic welding. The electrode has a shielded arc-type coating.

Electrode No. 170 can be put on practically all weldable grades of ferrous-base metals. Cast iron provides a fair base where impact is not a problem. The literature lists welding characteristics and hardness as well as recommended uses.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 670.





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Rope jobs like paver skip hoists, overhead cranes, large shovel and dragline hoists, and sawmill carriages demand these qualities. That's where the use of 6 x 37 Red-Strand wire rope saves time and money.

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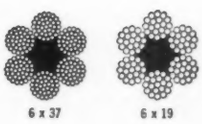
Look at a cross section of 6 x 37 wire rope. You see three rings of small, uniformly sized wires in each strand. This differs from a rope construction like 6 x 19, which contains fewer and larger wires.

The *smaller size* wires make 6 x 37 more *flexible*. The *larger number* of wires maintains rope *strength*.

Would this combination improve your wire rope service? Would it solve a problem for you? Leschen's higher-than-rated quality is also providing longer-than-expected service to heavy industry everywhere.

Check with your Leschen man. He can help you.

Leschen's 64-page Wire Rope Handbook tells you all about 6 x 37 and other Red-Strand wire rope constructions. Ask or send for your free copy.



6 x 37 6 x 19

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
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St. Louis 12, Missouri

LESCHEN
HERCULES Red-Strand WIRE ROPE

Unique Rigs Cut Time On Land-Clearing Job

The two hydraulically operated root-cutting knives at the rear of this Cat D8 tractor cut to a depth of 36 inches as the machine makes passes on four sides of the big tree.

A 9-foot 14-inch stinger arm attached to the bulldozer of this Cat D8 easily pushes over a tree, leaving most of the roots raised above the ground.

Tractor-mounted root cutter and stinger fell huge trees, which are burned while green with aid of wind device

Clearing of a 1,160-acre site for a new industrial, commercial, and residential construction project near Millbrae, Calif., is being speeded by two unique pieces of clearing equipment. Approximately 40,000 trees running to 6 feet in diameter are being felled, cut up, and burned in preparation for grading operations at the site.

LaFon Tree Service, Gardena, Calif., awarded the job of removing the trees, originally planned to use the popular method of stringing a chain between two tractors and pulling over the trees. The eucalyptus tree, which grows in profusion on this site, does not respond satisfactorily to this method, however, breaking off several feet above ground instead of toppling over with roots exposed.

Consequently, LaFon placed the problem in the hands of Peterson Tractor & Equipment Co., Caterpillar distributor in San Leandro, Calif., and American Tractor Equipment Corp., Oakland, Calif. The equipment devised by these firms is proving so effective that trees several feet in diameter are being felled in 3 to 4 minutes instead of the 1½ to 2 hours that was required under the old method.

Root-Cutter

The tree-removing machine consists of two basic components mounted on a Cat D8 tractor. One is a rear-mounted hydraulic ripper, designed by American Tractor & Equipment Co., which has two special root-cutting knives instead of the usual ripper teeth. Each knife is made in one piece, weighs 860 pounds, and is hardfaced on one side of the cutting edge so that it is self-sharpening. The knife is slightly hooked and has a shearing edge of 44 inches that extends 36 inches into the ground.

For larger trees, the tractor makes passes with the cutting knife close to the trunk on four sides. This cuts or snaps off the large roots that spread out beneath the tree. For

"They're working rings around the bigger trucks"

—says Ed Kimball, owner of Boylston Construction Co., Boylston, Mass., in telling how Hydra-Matic* GMC's are getting his jobs done quicker—and cutting costs to boot.

EXCAVATING AND MOVING 80,000 YARDS OF BANK GRAVEL IN SEVEN WEEKS calls for a team of eleven trucks and two shovels. Boylston Construction's two new 145 h.p. GMC M470's—equipped with 4-yard dump bodies and sideboards that hike their capacity to 8 yards—are working with nine trucks of other makes. All nine have greater horsepower—three of them are ten-wheelers. *"Those GMC's are hustling more gravel each day than any other rigs on the job," Kimball says.*

CLIMBING A STEEP UNPAVED GRADE—without room for a running start—is the only way out of the nearly completed excavation. Recently—when heavy rains made the grade slick and muddy, it proved too tough a pull for the big ten-wheelers when fully loaded. But the GMC's—their Hydra-Matic-controlled flow of power applied through single rear axles—made it every trip with loads heaped to 8 yards—just one less than the other trucks. *"We never even had them going all out," driver Jack Whalen boasts.*

GMC HYDRA-MATIC FUEL ECONOMIES really add up on the steady diet of one-mile hauls from pit to dumping point. The M470's (22,000 GVW) are each using 17 gallons of gas a day as compared with 27 gallons burned by a comparatively powered truck on the same job. *"And I'm looking forward to wiping all clutch-repair costs off my books," Kimball says. "My previous trucks wore out three clutches apiece every two years. To date, the GMC's haven't cost me a dime for any kind of repairs."*

*Hydra-Matic standard on many models; optional at extra cost on others.

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Still-green trees are burned shortly after being felled. The blaze is fanned by this Blevans four-blade propeller driven by a Trackson loader drive and mounted on a Cat D4 tractor.

smaller trees—those one foot in diameter or less—two passes are sufficient to sever the roots. The hydraulic ripper enables the operator to utilize the full weight of the tractor in this operation.

The second component then takes over. This is a front-mounted stinger attached to the dozer pusher arms above the trunnions of the tractor. The stinger is also attached to the bulldozer, and raised or lowered by a front-mounted cable control.

The stinger contacts the tree 9 feet 14 inches ahead of the dozer blade and at a height of 12 feet, and easily pushes it over with most of the roots raised above the ground. Roots left in the ground are later rooted out and burned, a comparatively simple task when the trees have been removed and the entire area has been cleared.

Wind Machine

Another piece of special equipment takes over in the burning process. To speed up this operation, the trees are ignited while still green, and the flames are fanned by a special blower devised by Peterson Tractor & Equipment Co.

The wind machine is mounted on a Caterpillar D4 tractor. The unit consists of a Blevans four-blade wooden propeller 7 feet 4 inches in diameter. The propeller is driven by a Trackson loader drive with pulleys and four V-belts.

Before the project is completed, approximately 4,500,000 cubic yards of earthmoving will be involved. Some 2 million cubic yards is being moved from graded areas to a portion of the tract extending from El Camino Real to the Bayshore Highway for future home sites. THE END

Prestressing Methods Available Under License

■ A new pamphlet from the Preload Co., Inc., describes a program through which the company will grant to selected licensees throughout the United States freedom to use design and construction methods developed by Preload for circular, linear, and area prestressing. Under this program, the licensee can take advantage of more than 50 U. S. patent applications owned or controlled by Preload and relating directly or indirectly to prestressing. The company also makes available, under certain conditions, its research facilities, engineering services, and special equipment.

The major types of construction for which prestressing has been developed include tanks, domes, roofs, pipe, linear members, cast-in-place structures, and pavements. Complete details of how Preload will work with the licensee are contained in a license agreement available on request.

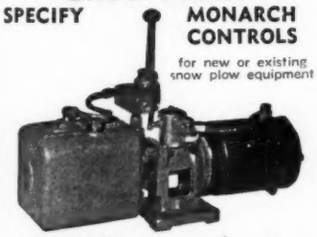
To obtain this literature write to the Preload Co., Inc., 211 E. 37th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 603.

Franki Foundation Moves

The headquarters of the Franki Foundation Co., formerly located in Pittsburgh, Pa., has been moved to 103 Park Ave., New York, N. Y. With the change, the company's New York office has also been moved to the same location. The firm, which also has a Philadelphia office, will maintain a branch office at 436 Seventh Ave. in Pittsburgh.

POWER HYDRAULICS for Snow Plows

SPECIFY MONARCH CONTROLS for new or existing snow plow equipment



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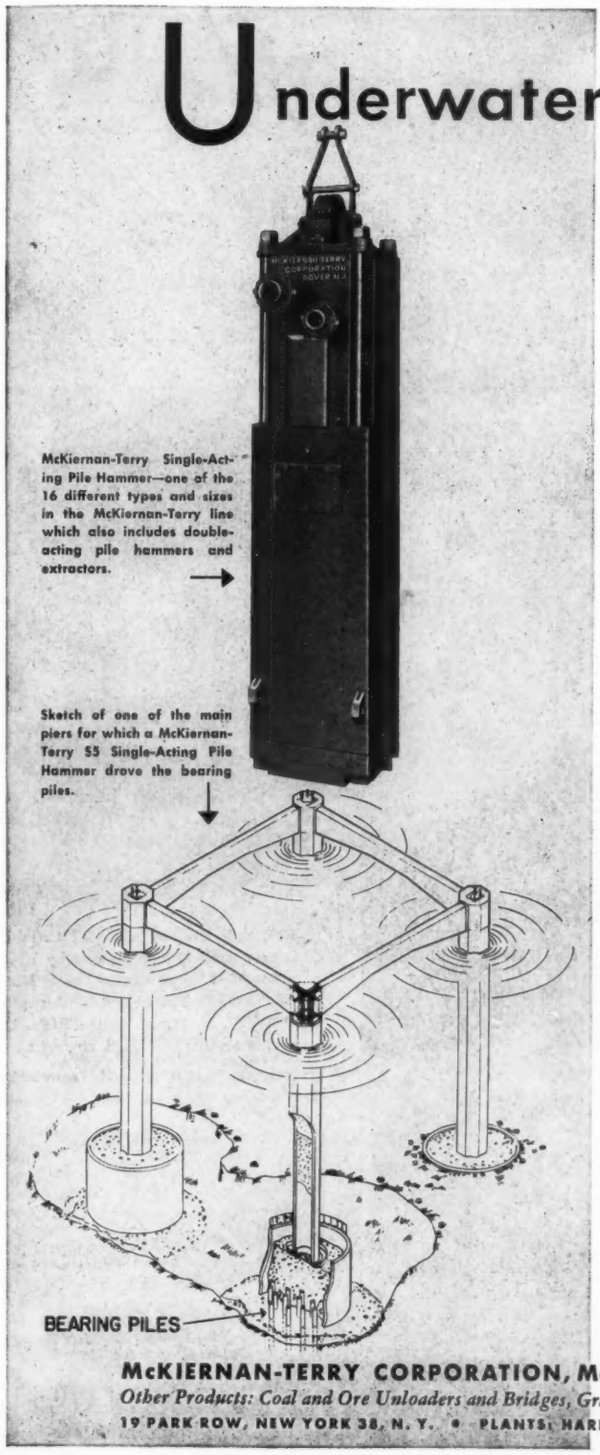
Underwater Pile Driving *with a* McKIERNAN-TERRY *Pile Hammer*


McKiernan-Terry Single-Acting Pile Hammer—one of the 16 different types and sizes in the McKiernan-Terry line which also includes double-acting pile hammers and extractors.
Sketch of one of the main piers for which a McKiernan-Terry S5 Single-Acting Pile Hammer drove the bearing piles.
BEARING PILES

THE JOB . . . driving 184 timber piles *under water,* to a pile cut-off 63 feet below sea level, with each pile submerged at least 25 feet before the steam was turned on.

THE LOCATION . . . foundations for two main towers of the Pacific Gas & Electric transmission line crossing San Francisco Bay near the San Mateo bridge.

THE PERFORMANCE . . . "We are happy to report that the trouble-free performance of the McKiernan-Terry S5 Single-Acting Pile Hammer on this job was most gratifying." (from a letter by the engineer of the contractor, Ben C. Gerwick, Inc. of San Francisco)

This report is typical of the results obtained by contractors all over the country who use McKiernan-Terry Single-Acting Pile Hammers . . . *the only hammers of this type that can be operated under water.* Write for bulletin describing these completely modern hammers in detail . . . built in a range of sizes to cover all requirements of driving into dense substances or for driving heavy mass piles.

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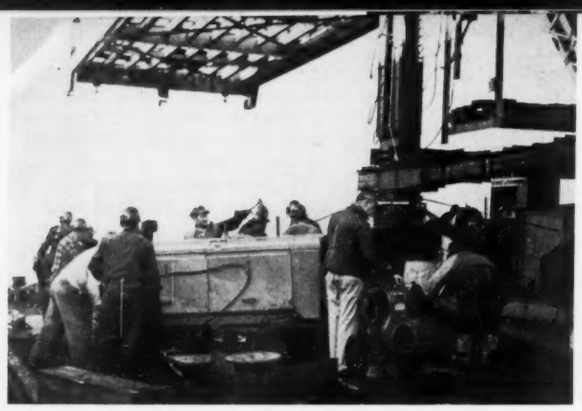
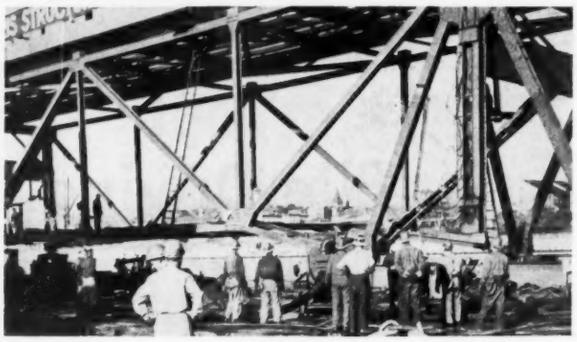


The fixed end of the span is supported on pivoting falsework on the west barge. Hoses from the six jacks in the jacking column lead to a Rodgers hydraulic pumping unit. The Foundation wellpoint pump at left and the Marlow pump at right will be used to pump in water for lowering the barge.

Moran Towing Corp. tugs nose the barges and their cargo in between the bridge piers. Welfare Island is at left, with the Manhattan skyline just beyond. Note rocker shoes and centering tongue at bottom of right end of span. Centering and engaging the span took only 10 minutes.



A view of the stationary end of the falsework, on the east barge, with jacking column at right. A pump for lowering the barge is at center.

Vertical Lift Span Placed In Floating-In Operation

TIME, TIDE, a fleet of tugboats, and a crew of steelworkers played the major roles in a bridge-building drama on New York City's East River September 27. With man and the elements cooperating perfectly, a 420-foot-long vertical lift span for the new Welfare Island Bridge was floated into place easily and without a hitch.

Harris Structural Steel Co., New York heavy-construction firm, directed this 6-hour production, which closed a new $6 million bridge providing access to the island from the Borough of Queens across the river's

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With the span positioned and engaged at centering devices, tugs hold the barges between the piers while jacks within the falsework are slowly lowered. This view from the north shows the Queensboro Bridge farther downstream. Welfare Island is at right.

The east or Queens side of the bridge, with the span positioned but not yet seated. Huge lift cables descend from the sheaves inside the tower (top) to the deep lift girder, to which they will be fastened.

Hydraulic jacks on barge-mounted falsework frame lower truss onto bridge piers with aid of tide

By WILLIAM T. DARDEN, Assistant Editor

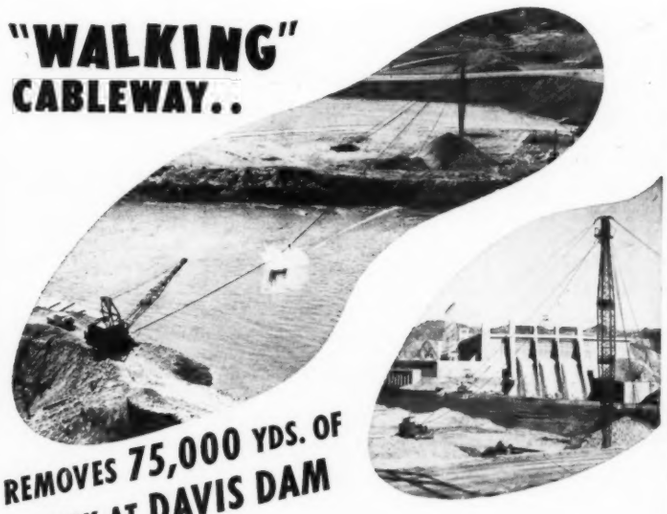
east channel. (See "Derricks Set Huge Sheaves for Lift Span, C&E, July, 1954, pg. 12.)

Not that preparations had gone so smoothly. Just two months previously, the 1,000-ton steel span had almost been lost in the river when one of the barges on which it was supported sprang a leak and sank in 14 feet of water at the dock. Preparations were being made to float the span into place the next day when the accident occurred. Fortunately, the falsework on the remaining barge held the span—though the unsupported end was 13 feet lower than the supported end—until it could be shored up and a new barge floated underneath.

It was touch and go for a few days, with the huge truss supported only by buckled falsework on the second barge. After emergency steps were taken, Harris crews spent a feverish 2 months erecting new falsework to support the span, and pumping out, refloating, and removing the sunken scow. It is estimated that the delay added more than $100,000 to the cost of the new structure.

Finally, after new preparations (including calculations involving tide

"WALKING" CABLEWAY..



REMOVES 75,000 YDS. OF ROCK AT DAVIS DAM

To deepen the Colorado River from Davis Dam to 2,000 ft. downstream, Grafe-Callahan Construction Co. employed a Sauerman Slackline Cableway in this unusual arrangement:

Mast and hoist of the 2-cu. yd. machine were mounted on wooden mats. Only four "steps" were required in covering the 2,000-ft. distance as the excavation progressed. Maximum span was 600 ft. A crawler crane, running on a 30-ft. cofferdam on the opposite bank, served as tail anchor.

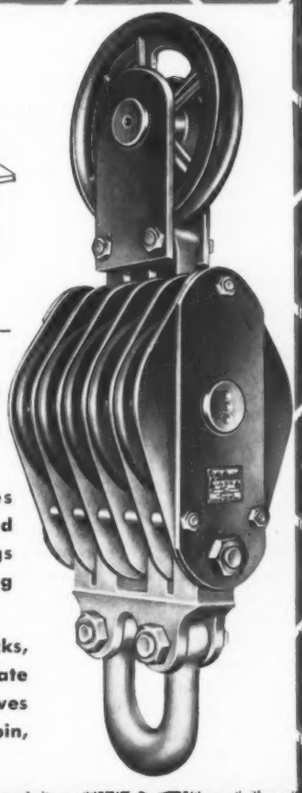
Total excavation was 75,000 yds. of rock. Excavation depth ranged from 10 to 15 ft. to provide the 20-ft. channel depth to lower tailwater at the power plant for maximum effective head on turbines.

Sauerman Slackline Cableways—1/3 to 3-1/2 cu. yds. in size—span water, bogs or pits to distances up to 1,000 ft. On the ordinary or the unusual job, this Sauerman equipment is unexcelled for deep rigging or handling rock, sand, clay, peat and ore.

Experienced Sauerman Engineers can solve your excavating problems. Write today. Request Catalog C, "Slackline Cableways", and also pertinent field reports.

SAUERMAN BROS., Inc.
564 S. Clinton St. Chicago 2, Illinois

"Reflections on Deflection"—
by Scottie McBlock



Check construction of your proposed Construction Block.

Undue deflection creates un-wanted stresses and misalignments in bearings causing premature bearing failures.

McKissick-constructed blocks, with a center or divider plate between each sheave gives intermediate support to pin, eliminates deflection.

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Box 2496 Tulsa, Oklahoma

and current) had been made, the floating-in operation was set for the morning of September 27. Bright and early that day, the two barges moved out from their Long Island City moorings with their burden securely fastened to a falsework frame and carried 48 feet above water level. By mid-afternoon the span was resting on the concrete bridge piers and the barges had been floated out from underneath. In the intervening hours, both man's ingenuity and nature's course had played their part in the operation.

The falsework frame on which the 12-panel truss span was fabricated and floated in included four vertical posts, two on each barge, which were cross braced so as to distribute the weight of the heavy truss. The two through trusses of the span are on 39-foot centers. The span actually rested—at the fourth panel point from each end—on four jacking columns which were part of the falsework frame, although they did not bear directly on the barges. A 60 × 90-foot wooden barge and a 90 × 125-foot steel barge were used to float the span in.

Jacking Setup

Six Harris hydraulic jacks, one on top of the other, were built into each jacking column. Operated remotely by Rodgers hydraulic pumping units, these jacks lifted the span 5 feet above the fixed frame. This was done so that the span would clear the concrete bridge piers and be in position to be lowered into place.

Jacking cylinders consisted of 11¼-inch-diameter rams, each having a 12-inch rise and a capacity of 300 tons. Closed height of each unit was 24 inches. On both ends of each jacking unit was a Rodgers Quick Coupler to prevent collapse in the event a hose burst. Each jacking column also had a 5-inch-diameter safety screw which was tightened as the jacks moved up the column.

Rodgers DW2 hydraulic piston-type pumps, powered by Wisconsin gas engines, were used in the jacking operation. The 2½-gpm systems were worked at 5,000 psi. Oil was stored in a 100-gallon reservoir. Harris provided for 100 per cent reserve pumping capacity in case of emergeney.

The jacking was done before the barges moved away from shore. At 8: 20 a. m., the trip to the bridge site was begun. Ever so slowly, five tugs nosed the barges out into the stream and up the channel to a point just south of the piers. Here, two more tugs lashed onto the barges on the upstream side, and the delicate job of maneuvering the span between the piers got under way.

For about 10 minutes the tugs gently nudged and pulled the barges, inching the span back and forth until it was lined up exactly with the piers. At 9: 50 a. m., the span was engaged at centering devices on both piers, and cables were strung to the shore on both sides of the channel to hold the barges in position.

Communications System

During this operation, J. N. Schnier, erection manager for Harris, directed the delicate maneuvers by means of Motorola two-way portable FM radio and an Audio-Hailer. The radio setup enabled him to keep in touch with the crews on each of the piers, while the Audio-Hailer, a portable electric megaphone, carried his instructions to the captain of the tug fleet, who was stationed on one of the barges.

Schnier rode the lower chord of the falsework frame and directed all operations from that vantage point. Senior Capt. Anton Huesby, fleet captain of the Moran Towing Corp.'s tugs, relayed Schnier's instructions to the tugboat pilots from the deck of one of the barges. Senior Capt. Frederick W. Snyder was on the other barge.

High tide occurred at 9: 35 a. m., and in accordance with Harris' plan the span was positioned and engaged during a period of virtually slack water. Cables from barges to shore were pulled taut, and tugs kept their noses up against the barges to keep them directly between the piers and prevent strain on the falsework or the span.

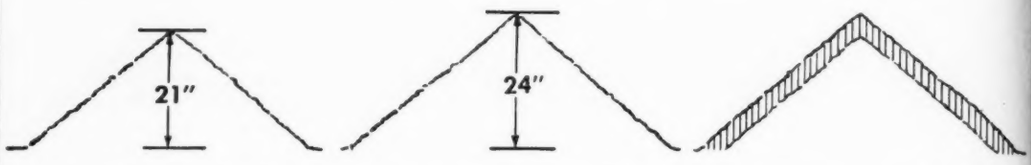
The lift span was now only a few feet above the seats on the piers. The jacks were lowered, bringing the span to within a foot of the piers. Tide was falling at the rate of about one foot an hour, so it was only a matter of a short wait before the span would be landed. From a distance, there seemed to be little activity at the bridge during this operation. The lowering of the jacks was so slow, and the fall of the tide even slower, that any movement was almost imperceptible. But from a ringside seat provided for officials and members of the press on a U. S. Army Corps of Engineers inspection and survey boat, one could now and then measure the downward movement of the span against the immobile piers and hear the instructions being broadcast to the crews.

At 10: 57 a. m. the connecting points on the span looked to be about 6 inches from their seats. Though the span was engaged at its centering points, downstream current fought with the tugs for possession of the barges and their cargo. Currents in this channel were something to be reckoned with, as earlier in the day the movement had been upstream toward Long Island Sound. At about 10: 15 the tide had changed perceptibly, and a strong downstream current was now pulling toward the ocean.

By 11: 18 it was impossible to see daylight between the pier seats and the connecting points on the span, and at 11:30 Schnier pronounced the span landed. Though the span was still fastened to the falsework on the barges, its weight was now borne by

QUESTION*

How much more material is there in a Three-Inch-Higher Windrow . . . 9% . . . 18% . . . 31% . . . ?



Cross section of an average, 21-inch high windrow . . . the area (width x height ÷ 2) is 614 sq in.

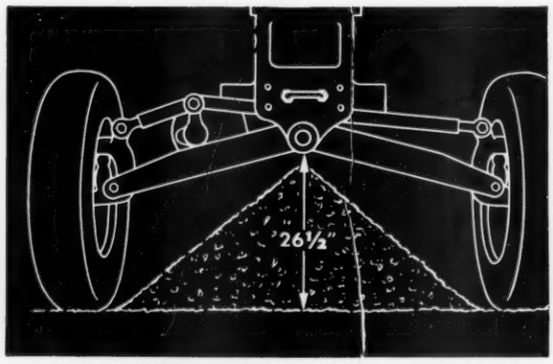
Now increase the height of the windrow by 3 in. The cross-section area now equals 804 sq in.

The difference . 190 sq in, over 30 percent more area, which means over 30 *percent more yardage.*

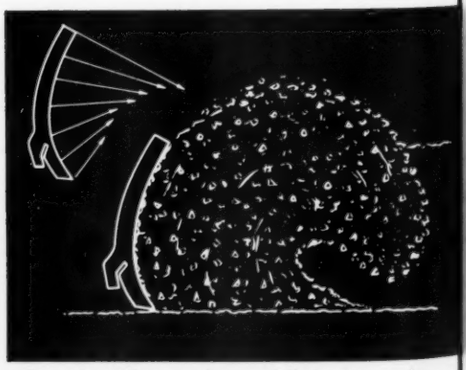
*Only a Combination of Advanced Design Features Lets a Motor Grader Handle Big Loads Fast

To take full advantage of even a *three-inch* difference in windrow height (as explained above) a heavy-duty motor grader needs new design and performance characteristics from front to rear . . . and from the top of the main frame to the bottom of the blade. No single feature can give you the increased work capacity that is so essential on road construction, maintenance and oil-mix jobs.

Now let's analyze the Allis-Chalmers 104-brake-horsepower AD-40 to see how it measures up to these stiff requirements.



1 **A high-arch front axle** to straddle big windrows . . . take advantage of that 3-inch difference and let big loads pass through to the blade.



2 **A rolling-action moldboard** . . . to insure a "live" load that rolls freely off the blade . . . moves the load faster and takes full advantage of engine power.

the piers. After unfastening the span, crews lent a hand to nature by pumping water into the barges with several pumps. This, together with the falling tide, eventually lowered the barges so that the falsework could be floated out from underneath the span.

Connecting Points

On the Queens or east side of the span, two rocker shoes were attached to the underside of the truss. Corresponding saddles on the pier waited to receive these rockers. This end of the span will be left free to move for expansion or contraction. On the west or island side, grooved jaws on each side of the truss fit over anchoring pins on the pier.

In the floating-in operation, the span did not come to rest directly on the connecting points on either pier. On the east side, a 6-inch rise of wood cushioning had been placed over the saddles, and the rocker shoes came to rest on these cushions. On the west or island side, four 500-ton jacks held the span 6 inches above the connecting pin. These elevations were necessary so that the take-up screws on the huge cables from the 37-ton sheaves in the lift towers could be threaded through the flanges of the lift girder and fastened with nuts.

Within a week, the span was pulled up 10 feet and the cushions and jacks removed. At this elevation, there is a 50-foot clearance underneath the bridge. When power is installed in the lift mechanism next spring, the span will be lifted another 50 feet to allow full clearance in the channel. During the interim, larger vessels will use the west channel of the river.

By 2: 30 p. m. the barges and their falsework frame were floating free of the span, and the big carriers tied up at the erection dock at 3: 15. The operation had gone exactly as planned, with a variance of only 15 minutes in scheduling. Fifty steelworkers had helped with the operation.

Frederick H. Zurmuhlen, commissioner of the Department of Public Works of the City of New York, watches the operation from the deck of the U. S. Army Corps of Engineers inspection and survey boat.

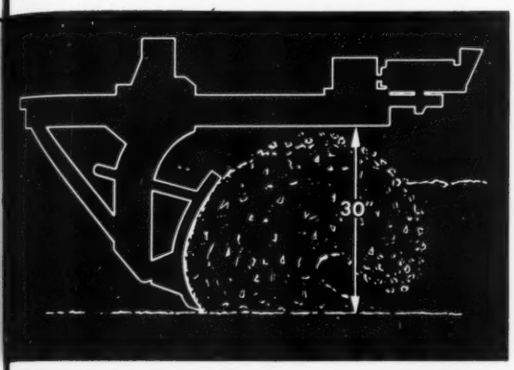
With work on the approaches virtually completed, construction crews and engineers will now concentrate their attention on the lift span. A U. S. Steel Co. 5-inch open-grating floor deck, 34 feet wide, will be built to carry three lanes of vehicular traffic, and 6-foot-wide concrete-filled open-grating sidewalks will be built on each side. Then there is the months-long job of synchronizing the lift mechanism so that the span is raised at exactly the same level and speed at both ends. It is expected the bridge will be opened to traffic next spring or early summer.

The new Welfare Island Bridge will relieve congestion on the Queensboro Bridge, which crosses the East River and Welfare Island about one-half mile downstream from the new bridge. The Queensboro Bridge is now the only means of vehicular access to the island, which contains a 7,000-bed city hospital plant. Through traffic on the bridge is frequently held up while vehicles drive on and off the elevators on the upstream side of the bridge which descend to the island below.

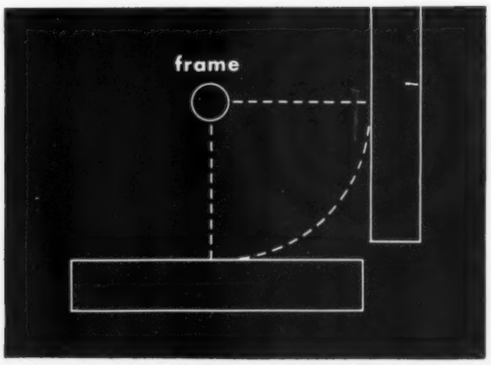
Personnel

Moore & Lopier, New York, N. Y., is the general contractor on the new bridge, with Harris Structural Steel Co. fabricating and erecting the superstructure. J. N. Schnier is erection manager for Harris, and Edward L. Guerber is chief engineer. Consulting engineers are Knappen-Tippetts-Abbett-McCarthy. The bridge is being built for the Department of Public Works of the City of New York. Frederick H. Zurmuhlen is public works commissioner.

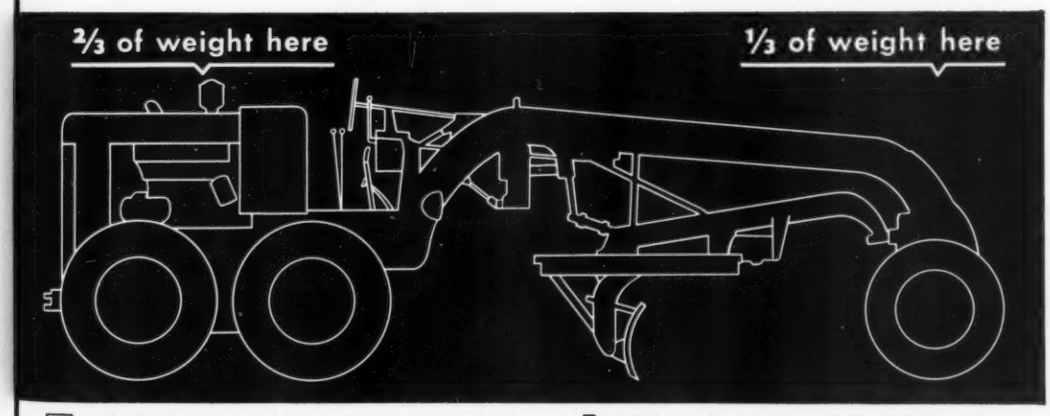
THE END



3 **Ample throat clearance** . . . to handle 30 percent bigger loads without disturbing free, rolling action . . . and without jamming dirt, oil-mix or any other material against the circle.

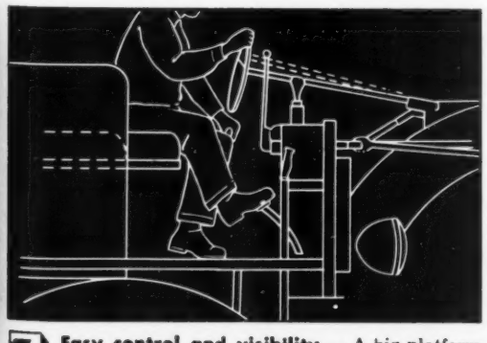


4 **Full blade freedom** . . . the exclusive tubular frame and a long tubular drawbar insure full blading effectiveness on the road, in the ditch or on the slope.



5 **Blading accuracy** is essential. A long wheel base, the tubular frame . . . and lift-cases located directly over the circle, provide smooth, accurate finishing.

6 **Balanced power, weight and traction** . . . a heavy-duty engine and *two-thirds* of the weight concentrated on tandem-drive rear wheels provide the best in traction, positive blade pressure and steer-ability.



7 **Easy control and visibility** — A big platform with plenty of leg room . . . adjustable seat and steering wheel . . . power steering will assure working ease. Single member frame, low control board and tapered platform corners provide "pilot-house" visibility.

This design, that combines working advantages every owner needs and wants, exists in only one motor grader . . . the Allis-Chalmers AD-40. *That's a fact* . . . a fact your Allis-Chalmers dealer will be glad to prove to you. Ask him to show you how the AD-40 gives you the *differences* that mean more work done . . . by a demonstration under on-the-job conditions.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

AD-40 Motor Grader
104 brake hp • Weight — 23,000 lb

Diamond Masonry Blades Bonded in Tungsten

■ New masonry blades bonded in tungsten carbide are announced by Victor Engineering Corp., 15 Maple Ave., Paoli, Pa. According to the manufacturer, the diamond is so firmly held by this material that a greater percentage of the diamond is used in actual cutting than is usual with such blades.

With this improved bonding material, the blades can cut highly abrasive materials such as concrete block, firebrick, sandstone, and granite with economy. The blades, available for all masonry and road saws, are also recommended for cutting both green and cured concrete.

For further information write to the company, or use the Request Card at page 18. Circle No. 548.

The new Bros Series A rotary plow, which attaches to front-end loader arms, is shown disposing of windrowed snow. The casting chute rotates 180 degrees. ►

Rotary Snowplow Replaces Bucket Loader

■ A rotary snowplow that mounts in place of the bucket on most wheel-type tractor front-end loaders, using the same pins, has been introduced by the Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S. E., Minneapolis, Minn. The Bros Series A Rotary unit operates on only 30 hp, yet is reported to be capable of plowing deep snow.

This plow operates on the Bros Sno-Flyr principle to cast snow at a rate of 3 to 4 tons a minute. The slit-spiral design of the rotor slots makes it possible to handle wet, chunky, or hard-packed snow as easily as soft fluffy snow.

In operation, a 5-yard dump truck can be loaded by a Series A in 30 seconds, as compared with 5 to 10 minutes generally required for hydraulic front-end bucket loaders. A casting chute extension simplifies truck loading, and because the operator can rotate the chute 180 degrees, it is possible to load into a truck on either side or straight ahead of the plow.

For further information write to the company, or use the Request Card at page 18. Circle No. 575.

Space-Saving Radio For Mobile Equipment

■ Two-way mobile radio equipment that measures only 5½ inches high, 9¼ inches wide, 17¾ inches long, and weighs 40 pounds has been developed by the Engineering Products Division, Radio Corp. of America, Camden, N. J. The RCA Carfone radio (CMC-10A) produces a minimum of 10 watts, over the entire 148 to 175-megacycle band. The equipment can be supplied for either narrow or standard-band response and, by simple rearrangement of internal jumpers, can be converted quickly and without additions for either 6 or 12-volt battery operation.

The new Carfone is delivered tuned to customer frequency and is complete with tubes and crystals, palm microphone, loudspeaker and case, control head, roof-top antenna, coaxial cable, battery and control cables with fuse block, and installation hardware.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 621.

Galion Transfers Evans

The Galion Iron Works & Mfg. Co., Galion, Ohio, manufacturer of road-building equipment, has transferred Charles O. Evans to the post of district representative in the states of Florida, Georgia, and North and South Carolina. Formerly of the Pacific Northwest territory, Mr. Evans replaces J. D. Talbott, who has resigned. He will make his headquarters in Columbia, S. C.

PROBLEM: RAISE A BRIDGE 20 FEET . . .

When this photograph was taken the jacks were suspended (in their supporting blocks) from the bridge deck while the cribbing was raised to the next jacking level.

SOLUTION: RODGERS HYDRAULIC JACKING UNITS!

It isn't often that you have to raise a bridge, but when you do, you'll discover why versatile, powerful Rodgers Hydraulic Jacking Cylinders and Pumps were selected by the Engineering Department, City of Minneapolis, as the safest, quickest and lowest cost method for raising two bridges spanning the Mississippi River. Both structures were raised twenty feet as part of the development of the upper river harbor.

One bridge, consisting of four 200 foot spans and the other, consisting of six 156 foot spans, were raised by lifting one span at a time. To do the job, twenty 50 ton jacking cylinders were placed on cribbing—10 at each end of the span to be raised. An electrically powered hydraulic pump operated the group of ten cylinders at each end. A 13 inch ram travel on the jacks produced completed lifts of an average of 5 feet per 8 hour day, including all cribbing and staying assemblies.

Remote, push button controls permitted the pump operator to go under the bridge where he could watch each lift first hand. The individual pumping source at each end assured absolutely equal lifting force at every jacking point.

Rodgers Hydraulic Jacking Units with hand or powered pumps can be used wherever needed to PUSH, LIFT or PULL. Available in capacities from 50 to 600 tons with standard ram travels from 6 to 48 inches. Ram travels to 72 inches available on special order. Rodgers engineering department will be glad to assist you in the selection of the exact jacking units required for your particular lifting, pulling or pushing job—large or small.

FREE—Complete report on the jacking phase of the bridge raising job described above—written for you by the engineer-in-charge! Ask for Bulletin 327. You'll also want Rodgers free Bulletin 317A. It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, and a description of hydraulic equipment used in the construction of tunnel shields.

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8" Line Pipe

250,000′ 8⅝" O.D.
.322 Wall—28.55 lb. Lapweld

All Used, No. 1 Grade, Machine Cleaned, Straight, 20′ SRL, Ends Beveled. Suitable Installation Oil, Water or Gas Pipe Line Systems. 850 to 900# PSI. Large Additional Quantities Same Size in Process Taking Up and Reconditioning. Priced Attractively Prompt Shipment Carrollton, Mo.

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PIPELINE PROJECT

125 W. 3rd St. Tulsa, Okla.

Phones 2-9128 — 54-4229

The Ewing steam cleaner delivers steam from cold water in two minutes, according to the manufacturer.

Portable Steam Cleaner

■ Simplicity of design is a feature of the Ewing portable oil-burning steam cleaner. This cleaner delivers up to 150 gallons per hour of steam at a pressure of 80 to 100 pounds, and 315 gph of water heated to 120 degrees F. It is reported to convert cold water to steam in two minutes.

Heat transfer is done through 120 feet of 1⅛-inch cold-formed steel coils. A turbine pump supplies water pressure and a gear pump keeps fuel pressure up.

Fuels consumed are kerosene, or No. 1 or No. 2 fuel oil. Operation requires 315 gph of water and three gallons of fuel per hour. The machine runs off a 110-volt, 60-cycle single-phase power source.

Safety features include automatic steam-temperature control and thermal overload motor protection. A three-way steam valve provides an open steam line at all times.

The machine is mounted on 10-inch rubber-tired wheels. It is delivered equipped with wire-braid steam hose, a solution hose, and a vacuum steam nozzle.

For further information write to the Ewing Mfg. Co., P. O. Box 875, Oklahoma City, Okla., or use the Request Card at page 18. Circle No. 583.

Booklet on Vibrators For Concrete Pipe Forms

■ A booklet giving facts and figures on the application of external vibration in the manufacture of concrete pipe is offered by the Viber Co., 726 S. Flower St., Burbank, Calif. The literature emphasizes that external vibration applied to outside steel forms produces concrete pipe with a smooth inside surface and low frictional loss characteristics.

The Viber Model PX vibrators described are essentially a conventional moving-vane-type pneumatic motor direct-connected to an eccentric weight. Clamped to the form, they develop controlled vibrations up to 12,000 rpm.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 651.

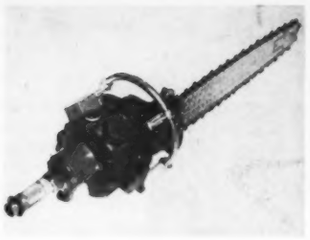
Newest Armco Plant Nears Completion

Within another month, construction of the new steel fabricating plant being built by Armco Steel Corp. near Tempe, Ariz., is expected to be virtually completed. Located on a 10-acre tract and costing about $100,000, the plant will be devoted to the production of corrugated metal drainage pipe of various sizes.

Air-Powered Chain Saw For Continuous Service

■ An air-powered version of the Portocut chain saw is announced by Vulcan Iron Works Co., 1423 Stout, Denver, Colo. The saw is powered by a 3½-hp 5-cylinder radial-piston air motor that develops uniform torque at all speeds. The manufacturer emphasizes that motor racing is not required to get power. The unit, rated for continuous service, weighs 46 pounds.

Ball bearings are used throughout in the saw's construction. The cutter bar carries a spring-loaded roller which reduces friction and wear and



The Portocut air-powered chain saw.

automatically applies power-chain tension. The thin 2-strand alloy-steel chain removes only 5/16 inches of kerf.

The Portocut saw can be used for underwater cutting. One of the features of the saw is the high-carbon steel cutter bar which has an easily replaceable wearing strip.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 589.

New Dart Salesman

Jack J. Burke has been named eastern district sales representative for the Dart Truck Co., Kansas City, Mo., manufacturer of heavy-duty off-highway trucks. He formerly served in a similar position with Gardner-Denver Co.

A heaping bucket every time!

WATCH THIS.....

1 Watch this amazing bucket action—just flip the direction lever to "Forward" and step on the gas

2 Digging in—the torque converter delivers smooth, steady power. Note the tread-marks—no wheel spin

3 Roll back the heaped-up bucket—tip-back action where it counts: *in the pile*

4 Lift the bucket clear, hold it level—that heaped-up load is well over a cubic yard of material

5 Back out—flip the lever to "Reverse" and step on the gas; no clutch, no gear-shift, no wasted time

6 Dump the load, back away, and hustle in for another heaping bucket—makes short work of loading a truck

You get a full bucket every pass with a MICHIGAN . . . and more passes every hour. Result: bigger yardage! For a real convincer, have a demonstration on your job—your MICHIGAN* dealer will arrange it. Let's make a date—send the coupon on your letterhead.

*A Trademark of Clark Equipment Company

CLARK EQUIPMENT

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Construction Machinery Division
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Have your dealer make a date to demonstrate the MICHIGAN Tractor

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

loads a Clement 20-yard dump trailer pulled by a Mack tractor.

A cable-dump mechanism on the Mack truck tractor unloads the Clement trailer at the fill site.
C&E Staff Photos

Big equipment is used to excavate, compact more than a million cubic yards of material

Helicopter Plant Site Requires Heavy Grading

MORE THAN 1,000,000 cubic yards of sand and gravel are being moved over a 250-acre plot near Stratford, Conn., to prepare the way for construction of a huge helicopter-manufacturing plant. Sikorsky Aircraft, Bridgeport, Conn., a division of United Aircraft Corp., is spending over $17 million for a 750,000-square-foot building just off the Merritt Parkway on the Housatonic River.

The first major contract, awarded to D'Addario Construction Co., Bridgeport, calls for stripping about 175,000 cubic yards of topsoil and excavating 1,200,000 cubic yards of the native material. Practically no borrow is required.

The contractor moved in early this year, and expects to be out by the spring of 1955. Most of the stripping was done with three Allis-Chalmers 18-yard scrapers. The topsoil was stockpiled for later use.

The greater portion of the excavating is being done with one 1½-yard Northwest and two 2-yard Lorain shovels. A fleet of trucks consisting of two Euclid 10-yard end-dumps, seven Mack 14-yard trucks, and three Clement 20-yard trailers does all the hauling. Fills are compacted by the tires of the hauling equipment and by a Bros 10-ton Wobble-Wheel roller. To achieve the required 95 per cent density, the contractor is piping water from wells and sprinkling it on the fills with hoses.

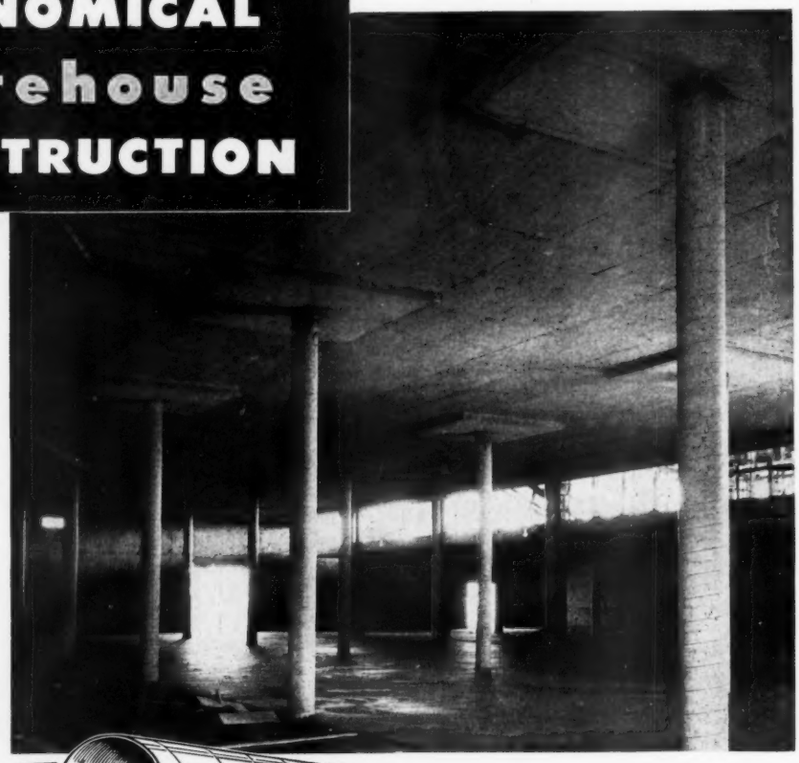
Cuts are as deep as 35 feet, but fills average only 10 feet. Fill material is spread in 8-inch lifts. The three scrapers together average about 3,500 yards a day, and the shovels have a combined production average of about 7,000 cubic yards.

A swamp area is being mucked out with two Lorain clamshells and filled with gravel to form the foundation of the sewage-treatment plant. The muck, totaling 150,000 cubic yards, is loaded in trucks and dumped upstream.

Other major equipment being used by D'Addario includes a Galion grader, a Lorain backhoe for trenches, five Caterpillar D8 dozers, and one Allis-Chalmers HD20 tractor for push-loading.

All equipment is serviced at night with Gulf products dispensed from a grease truck. A three-man crew

ECONOMICAL Warehouse CONSTRUCTION



Southern Rwy. warehouse, Jacksonville, Fla.
Wesley and Co., Contractors and Engineers

Sonotube®

FIBRE FORMS

for round columns of concrete

The round concrete columns for this warehouse were formed with low cost SONOTUBES of 13.5″ I.D. 17′ in height.

Whatever the structure, for a fast, economical method of forming round columns of concrete, use SONOTUBE Fibre Forms and save time, money and labor!

SONOTUBES are lightweight and easy to handle . . . require minimum bracing. Approved by architects and engineers, widely used by contractors everywhere.

In 31 sizes, from 1″ to 36″ I.D. up to 50′ long. Can be ordered in specified lengths or sawed to your requirements on the job.

DENFORM reusable capital form designed for use with **SONOTUBES.** Write for details

See our catalog in Sweet's

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SONOCO PRODUCTS COMPANY
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sonoco — "PAPER CARRIERS" — REG. U.S. PAT. OFF.

MOVING? Be sure to give us 30 days' notice of your change of address—and let us have your old as well as your new address.

Unless you do this you may skip an issue or two before the correction is made—and you won't want to be missing any issues of CONTRACTORS & ENGINEERS these days!

CONTRACTORS AND ENGINEERS
470 Fourth Ave., New York 16, N. Y.

The versatile Hough Payloader unloads sections of clay pipe from a trailer.

Robbins plastic pipe spacers separate and support three layers of lightweight fabric pipe in this trench at the plant site.

working from 3 to 11 p. m. sees to it that all machinery is in top working order so that no time will be lost at the beginning of the next day's shift.

Erection

As soon as the building area was graded, The E. & F. Construction Co., Inc., Bridgeport, moved in to start on the foundations. Because the plant is practically all one story, foundation work consisted mostly of excavating and placing concrete for simple wall and column footings. For the large footings in the hangar area, a Lorain backhoe was used. Otherwise, all of the holes for the exterior column footings and trenches for wall footings were cut with a Gradall. Equipped with a 36-inch bucket, this multi-purpose unit has proved very effective in excavating footing holes.

Concrete for the footings is chuted directly from ready-mix trucks. The neat lines cut by the Gradall eliminate the need for forms. Plastic-coated plywood is used to form the piers.

Concrete is batched on the site in a Blaw-Knox plant with a capacity of nearly 400 cubic yards a day. Three sizes of aggregate are trucked in from local suppliers and dumped into a hopper. A reciprocating plate feeder moves the materials from the hopper to a bucket elevator, which carries them to the bins. A swivel chute operated from below directs the flow of aggregate.

Bulk cement carriers unload into a hopper covered by a wood shack. A screw conveyor carries the material to a bucket elevator, which fills a 350-barrel storage bin. Overflow goes into a 400-barrel silo.

Below the bins, aggregates are batched by hand, but cement and water are added automatically. E. & F. is using six Rex truck-mixers—two 7-yard and four 4½-yard units.

For basement walls and suspended slabs, 3,300-pound concrete is required. All other concrete is 2,700-pound. Basement walls are waterproofed by adding 1½ gallons of Anti-Hydro for each cubic yard of concrete. Plastiment is used when it is necessary to retard the set.

Suspended slabs are required only in the front office section and in rear locker rooms. Concrete for these areas is for the most part being placed with a Manitowoc crane. Standard wood forms supported by Acrow adjustable steel shores are being used.

Structural steel is being erected by Harris Structural Steel Co., Inc., New York, N. Y. E. & F. will sheath the steel framework with brick and aluminum walls.

Nelson H. Downs, assistant to the general manager of Sikorsky Aircraft, is supervisor of the over-all project. Orlando Callado is general foreman for D'Addario Construction Co., and Dick Delotto is superintendent of E. & F.'s crews. Fairbrother & Miehls, and Albert Kahn Associated Architects and Engineers, Inc., Detroit, Mich., are the architects and engineers. THE END

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Rock Drills, Pavement Breakers and Clay Diggers

Vulcan Tool Manufacturing Co.

35-43 Liberty Street, Quincy 69, Mass.

Branch Offices and Warehouse Stock.

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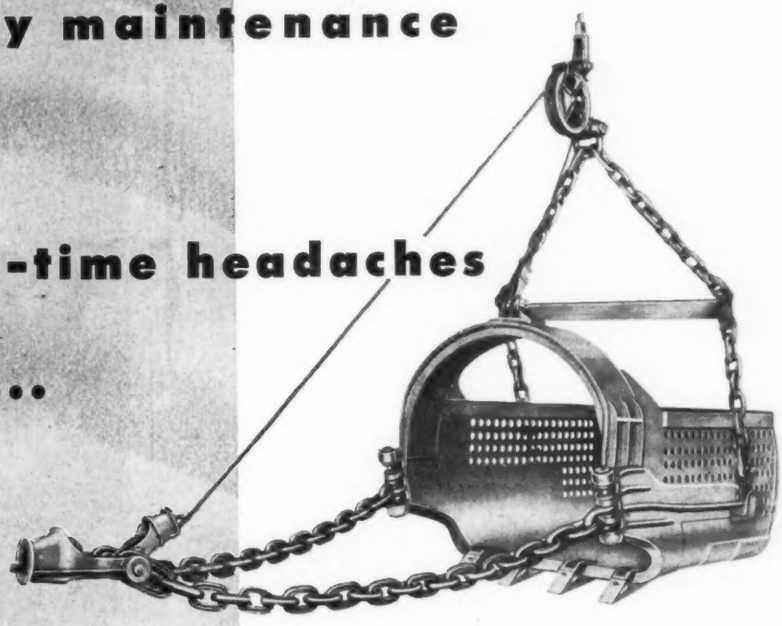
Send for catalog or see your local distributor.

lick costly maintenance and down-time headaches with...



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Engineered for dependable operation . . . job after job!

Hendrix Lightweight DRAGLINE BUCKETS

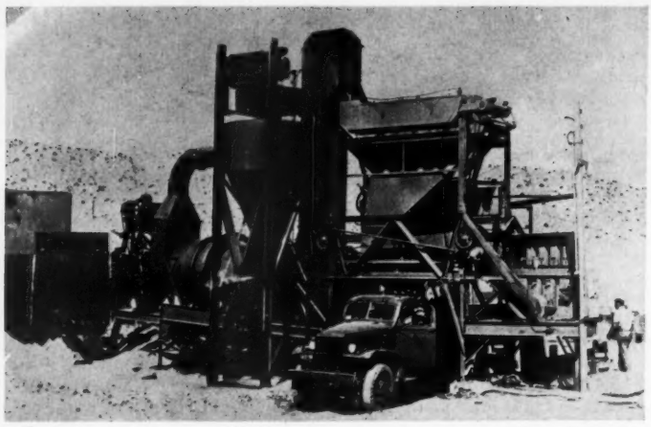
⅜ to 40 Cubic Yards

A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

Hendrix Buckets available without perforations on special order.

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA



The new Model TM batch-type asphalt plant, designed to travel over rough ground, can be set up fast with a new self-erecting feature. The cyclone dust collector shown to the left of the truck is offered as an accessory. ►

New Batch-Type Plant Designed for Portability Has Self-Erecting Feature for Fast Set-Up

■ A completely portable batch-type asphalt plant has been placed on the market by The Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles 11, Calif. The new Standard Model TM, a complete batch-type plant, is designed for use in areas where larger plants cannot be erected and operated profitably, and where portability is an important factor. Because the plant's welded-steel framework is heavily braced to withstand torsion and stress in transit, and with undue vibration largely eliminated, the portable asphalt plant may be hauled anywhere. The unit is mounted on pneumatic truck tires, and with a tractor-type trailer hitch and air connections it can be moved by a semi-type truck tractor.

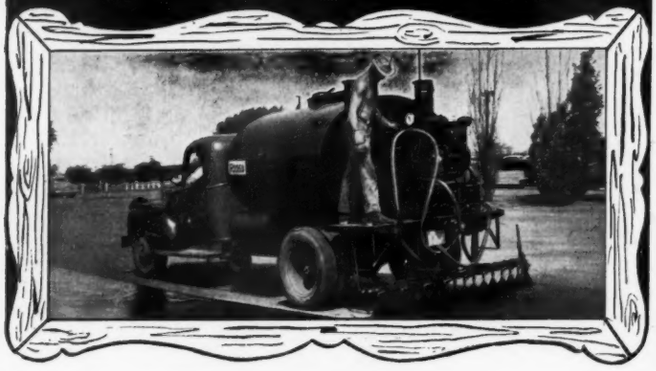
The manufacturer points to ease of erection as one of the big features of the new Model TM portable plant. The entire cage, consisting of vibrating screen, mixing unit, aggregate weigh-hopper, and asphalt bucket, is raised into position by push-button control. Total time for this operation is reported to be 30 minutes.

The hot and cold elevators are in operating position on the trailer. The hot elevator, a vertical chain and bucket unit, is hinged for easy erection by a block and tackle. The cold elevator is telescoped for traveling and is simply lowered into position from the trailer. It can be completely removed if a shorter trailer length is desired.

It is estimated that under normal

PICTURE OF A CONTRACTOR...

MAKING MONEY!



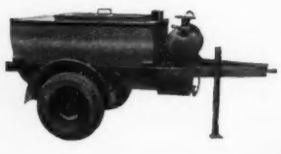
with a ROSCO

That's a photo of Francis Willette of the Willette Excavating Co. blacktopping the 8300 sq. yd. parking lot of the Dunwoody Institute in Minneapolis. His Rosco Model RHU Maintenance Distributor is making money on every job. Quick to start and get going, the RHU is designed for economical bituminous maintenance and limited construction. It has many of the features required by contractors . . . as well as municipalities. For driveways, alleys, streets, parking lots, shoulders, re-shaping curves, patching, sealing and a host of other jobs . . . Model RHU will get YOU "into the profit picture". Check the money-making features with your Rosco dealer. He'll show you what Model RHU can do for you. 800 to 1000 gallon capacity.

2-Wheel Model RMT Maintenance Unit with front mounted heaters and rear mounted pump and engine is available in 400, 500 or 600 gallon sizes.

ROSCO ASPHALT KETTLES

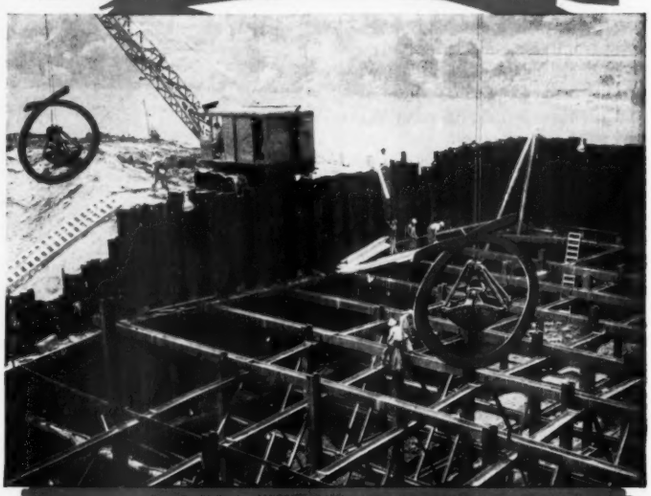
Used by contractors, highway departments, roofers and waterproofers for heating and melting all types of bituminous materials. Two-pass heating system, ruggedly built. Capacity 2, 3 or 4 barrels.



ROSCO MINNEAPOLIS

ROSCO MANUFACTURING CO.
3118 SNELLING AVE. • MINNEAPOLIS 6, MINNESOTA

PLACEMENT CONTROL



AN OWEN FEATURE

The placing of a bucket in a narrow trench or caisson; or between closely spaced cribbing requires skill.

Whether it "lands" properly to assure efficient digging is largely a matter of correct bucket design.

Many an operator prefers Owen Buckets because they respond readily to his efforts — go where he wants them to go — and land in unseen places in an upright position ready to take a tremendous bite.

It's largely a matter of design — proportioning and balance, all of which are built into every Owen Bucket as a result of decades of "know-how" based on specialized experience.

AN ARMFUL AT EVERY GRAB

THE OWEN BUCKET CO.
6030 Breakwater Ave., Cleveland 2, Ohio
BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

working conditions, the complete plant—including all the accessories—can be erected in less than one day. One user reports that a two-man crew, working without a tractor, erected the main sections in 2 hours.

The Model TM portable batch-type asphalt plant has a Symons horizontal-type screen to control gradation for four separations. A screen enclosure eliminates all dust nuisance at this point. Similar in design to the larger Standard Model RB, the new plant has a welded-steel aggregate weigh-hopper and an asphalt bucket suspended on hopper-type scales with levers. The mixer, which has a heavy-duty welded steel one-piece body with removable cast-alloy liners, is identical with those found on the larger Standard plants. A big feature of this mixer is the fact that the liners may be quickly replaced without the necessity of removing the jacket.

A multi-compartment storage bin made of heavy-gage steel has four sections with overflow and tailing spouts. An overflow bin with manually-operated discharge gates is part of the storage bin. An extra-large dryer is designed for top asphalt production, even where aggregates have an extremely high moisture content. Normally, the 5-foot dryer will average 40 to 50 tons of aggregate per hour. It may be operated by a gasoline, electric, or diesel power unit.

Because all controls of the new plant are located on the operating deck, one man, in most cases, can run the entire plant from a central location. All accessories designed for the plant are skid-mounted for truck loading, and they are also available with a tractor-type trailer hitch and air connections.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 518.

New Diaphragm Pump For Dewatering Jobs

■ A new diaphragm pump has been introduced by the Essick Mfg. Co. and its Sterling Machinery Division. The Model 4D diaphragm pump has 4-inch suction and 4-inch discharge fittings. It is rated at 6,000 gph.

According to the manufacturer, improvements in design have reduced the pulsation usually found in this type of pump. The reduction gears are totally enclosed to eliminate the wear and corrosion of dirt and water.

The Model 4D is furnished on a steel base, with 16-inch steel wheels or 400:8 pneumatic tires.

For further information write to either concern at 1950 Sante Fe Ave., Los Angeles 21, Calif., or use the Request Card that is bound in at page 18. Circle No. 511.

Think what

Flintseal* **saves you**

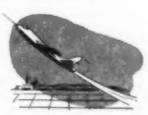
per mile of joints

For mile after mile of trouble-free and economical concrete pavement joints, specify FLINTSEAL.

A rubber-asphalt hot-poured compound, Flintseal *holds* its bond and *seals* out water *positively* through all weather. Won't crack or fail in cold. Won't flow or smear in heat. Stays extensible and compressible through expansion and contraction of the pavement slabs. Remember, for every mile of pavement you have approximately two miles of joints.

One application of Flintseal lasts for years . . . and years. That's how you can save.

And specify FLINTSEAL JFR (jet fuel resistant) to seal joints in critical areas on air fields.



Both FLINTSEAL and FLINTSEAL JFR meet State and Federal specifications. ★ Send for complete technical information today.

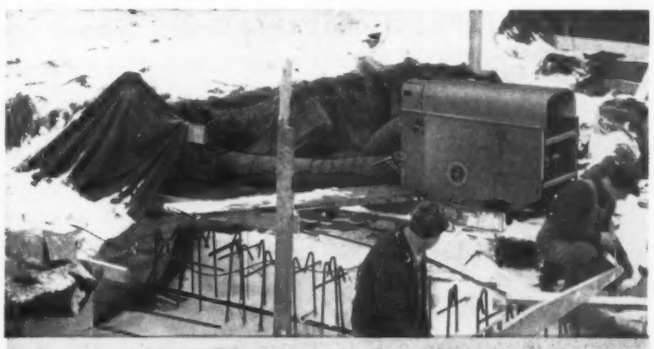
*Reg. U. S. Pat. Off.

Over 50 Years Specialized Experience at Your Service . . . by 'phone, mail or personal call. No obligation.

FLINTKOTE

THE FLINTKOTE COMPANY, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N. Y.; 55th & Alameda Sts., Los Angeles 54, Calif.

The Flintkote Co. of Canada, Ltd.—Toronto, Ontario



This newly-poured concrete foundation at the Kurth Malting Works, Minneapolis, Minnesota, was protected while it was setting by a Herman Nelson Portable Heater.

Why does Herman Nelson outsell all other portable air heaters?

Because: indoors or outdoors, Herman Nelson Portable Air Heaters are best for any job.

HERE ARE THE FACTS! Complete safety indoors . . . clean, fume-free, heated air in the working area, with all dangerous gases vented outside!

Maximum efficiency outdoors . . . with flexible canvas ducts channeling heat right to the spot where you need it!

More than 30,000 Herman Nelson Portable Heaters are in use today. Whether you buy, rent, or lease, you'll get the best deal if you see your Herman Nelson Distributor first. FLEET OPERATORS: Ask about our Fleet Users' Replacement-Leasing Plan . . . learn the *extra* advantages in standardizing on Herman Nelson!

HERMAN NELSON

Best Known Name In

PORTABLE AIR HEATERS

DIVISION OF AMERICAN AIR FILTER CO., INC.
MOLINE, ILLINOIS

FREE! MONTHLY WEATHER FORECASTING SERVICE
Better than 85% accurate over the past three years!

HERMAN NELSON
Division of American Air Filter Company, Inc.
Dept. 32, Moline, Illinois

Please send me your monthly weather forecast chart, with no cost or obligation to myself.

☐ We are in the market for a portable air heater. ☐ We are not in the market, but would like information for our files.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

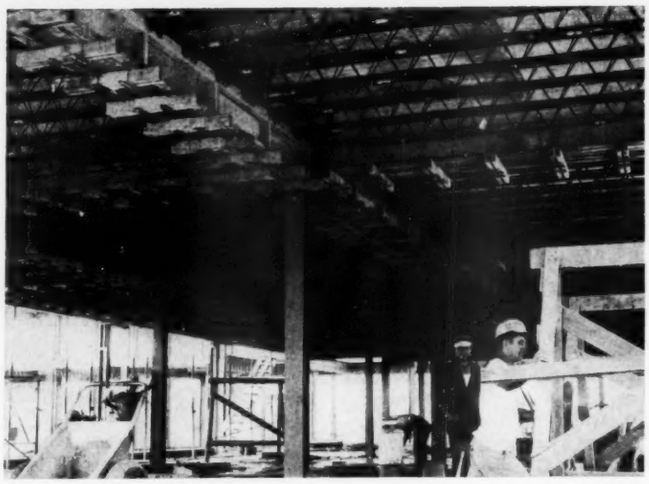
All-Steel Barricade Folds Up For Storing

■ An all-steel barricade with a baked-enamel finish has been placed on the market by Fenton Industries, 5101 San Fernando Road West, Los Angeles, Calif. The barricade has a traffic-yellow finish with the word "caution" lettered in baked enamel. The unit is adaptable to Scotchlite if desired.

Made with rivets and bolts, the compact barricade is easily transported and folds for storing. It has no nails to pull loose, nor boards to splinter.

A light-locking feature prevents theft of the light.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 524.



Lightweight Hico girders provide a convenient way to support concrete ceiling forms. The girders, adjustable for span length and camber, leave a clear working span below.

Hard-Facing Alloys

■ Hard-facing welding rods of cobalt-chromium-tungsten alloys are covered in a leaflet from Crobalt, Inc., 2800 S. State St., Ann Arbor, Mich. Applied to steel or cast-iron parts of any kind, these hard-facing alloys offer hardness and high resistance to abrasion, impact, corrosion, and oxidation at high and normal temperatures. They are applied by normal welding or brazing methods, using inert-gas welding or an oxy-acetylene torch.

Typical applications listed include: diesel engine valves, impellers and shafts of pumps, screw conveyors, and many wearing parts of earth-moving equipment.

To obtain Bulletin 102 write to the company, or use the Request Card at page 18. Circle No. 527.

Light Girders Support Concrete Ceiling Forms

■ Girders designed as supports for concrete ceiling forms are made by the Webrib Steel Corp., 120 Broadway, New York 5, N. Y. The Hico form supports are assembled into clear spans, from 3 to 27 feet long, from sections available in several lengths. Special end pieces accommodate the girders to all types of supports—simple, haunched, or skewed. The girders will support form boards or prefabricated forms while leaving a clear working space below.

The 6-inch-wide compression side of the girders, on which the forms rest, is stiff to resist buckling. The lower or tension side has turnbuckles which tighten to provide a convenient method of cambering to correct for deflection. This can be done before or after concrete is poured. Special connections provide large curvatures for arch centering.

For further information write to the company, or use the Request Card at page 18. Circle No. 638.

Simple Shoring Method Requires No Cutting

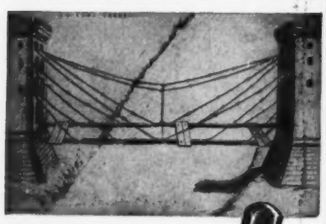
■ A new leaflet details how the Elis shoring method practically eliminates waste of form lumber because it entails no cutting or splicing and little nailing. The metal parts of the shoring equipment consist of clamps, jacks, and shorehead clamps to fit any dressed 4×4 form lumber. Precut Elis sticks are also available for use as standard shore members.

This system uses a shore member made up of two overlapping pieces of lumber that are adjusted to obtain the proper height, then held securely by a simple shore-holder clamp. Complete details are contained in the leaflet.

To obtain Bulletin 26N write to the Elis Equipment Co., Inc., 211 N. W. Fourth St., Oklahoma City 2, Okla., or use the Request Card at page 18. Circle No. 529.

Verantius' Pons Ferreus

A SUSPENSION BRIDGE DESIGN early seventeenth century



Engineering problems have been growing more and more complex in the past 300 years, and with them has grown the need for greater drafting precision. Since 1662, when the first Staedtler pencils were produced in Nurnberg, Germany, Staedtler has made constant improvements in pencil design and manufacture. Today, the Mars-Lumograph is America's finest imported drawing pencil; in the clutch pencil field the combination of the new 1001 Mars Technico push-button lead holder and 1904 Mars-Lumograph imported drawing leads insures your having the very best.

The 2886 Mars-Lumograph drawing pencil gives you precise thickness and the blackness of line needed for crisper, cleaner prints. Perfectly graded in 19 degrees; EXEXB to 9H. $1.50 per dozen—less in quantity.

The 1001 Technico Mars-Lumograph push-button lead holder costs no more than ordinary holders, has a noiseless, smooth-working, low-friction clutch mechanism, lightweight wood construction with perfect balance and, built into the push-button cap, a unique lead sharpener. $1.50 each—less in quantity.

1904 Mars-Lumograph Imported Drawing Leads are so opaque that inking-in is not necessary. Leads are ribbed for firm clutch grip and each has a removable cap which prevents sliding from holder. Available in 18 degrees; EXB to 9H. $1.20 per dozen—less in quantity.

J.S. STAEDTLER, INC.
25 DICAROLIS COURT
HACKENSACK, NEW JERSEY

GET DOUBLE-BARRELED SAVINGS with JACKSON WHEELBARROWS

Model S11 Barrow

LONGER LIFE

You'll get many years of hard usage from this ruggedly built Jackson barrow. Heavy gauge steel trays, corners press formed and double folded for non-leakable handling of large capacity loads.

LESS UPKEEP

Sturdy wooden handles (or all-steel construction), strong bracing and good weight distribution give trouble-free performance under any conditions. Available with oil-impregnated bearings—another Jackson feature that means a minimum of maintenance.

There is a Jackson for your every need—write today for details.

JACKSON MANUFACTURING COMPANY
HARRISBURG, PENNSYLVANIA

Oldest and largest wheelbarrow maker in America

SAVES DAYS WITH WACO ALL-STEEL SHORES

Contractor: Smith Construction Co.
Job Site: New Haven, Connecticut

Exclusive New Waco SPEEDSET

Adjusts in Seconds!

Test Waco all-steel Shores against others on the same job . . . like the Smith Construction Company did in New Haven . . . and you'll see for yourself how Waco saves days and dollars! That's because Waco Shores are faster to set up, faster to take down and faster to handle from start to finish.

Only three shore sizes handle all your shoring jobs. Choice of plate or "J" type head to fit every shoring requirement.

MEMO FROM THE COST ACCOUNTING DEPARTMENT

It's good business to own enough Waco Shores to handle most jobs . . . then rent extras for unusual requirements. On the average, Waco Shores pay for themselves in less than a year and you're money ahead from then on.

There's no maintenance upkeep or replacement cost on Waco all-steel Shores so the cash you save on equipment rental and man-hours is clear profit.

WACO MANUFACTURING COMPANY

WACO

3569 Wooddale Avenue
Minneapolis 16, Minnesota

Licensees

Waco-May Co.
Los Angeles

Armson Iron Works
Windsor, Canada

Decompression Unit Helps Safeguard Tunnel Crews

A decompression chamber for testing and treating under-river workers for compressed-air sickness (bends) has been put into operation at the medical clinic being operated by the Port of New York Authority at the site of construction work on the new third tube of the Lincoln Tunnel under the Hudson River.

The clinic, located at Weehawken, N. J., just across the Hudson from Manhattan, was provided by the Port Authority with the cooperation of contractors and labor unions on the project. Built at a cost of $60,000, the single-story structure has 3,300 square feet of floor space devoted to physiotherapy, audiometer, X-ray, surgical, examination, and laboratory facilities, as well as the decompression unit. Four physicians, three nurses, and medical technicians make up the staff.

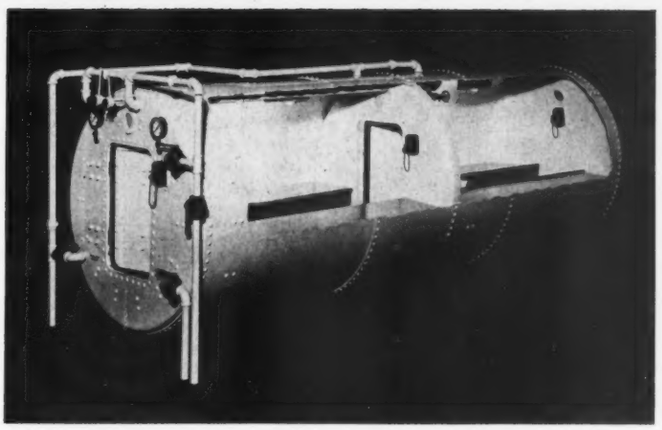
The chamber is a cylindrical steel lock 18½ feet long and 6 feet in diameter. A front lock for testing workers' resistance to pressurized working conditions accommodates eight men. A rear lock will be used in treating compressed-air illness. Separate air-supply systems with two-way control supply pressure 5 to 15 pounds above atmospheric pressure to the front lock and a maximum of 70 pounds above atmospheric pressure to the rear lock. Telephones and glass windows enable the workers to communicate their reactions to attendants.

Routine decompression of workers after each shift in the tunnel will be handled in a larger chamber located in the bulkhead connecting the tunnel with the land shaft.

Because of the nature of compressed-air illness, the clinic will be manned around the clock six days a week. Every "sand hog" on the job will wear an identification badge carrying instructions that, in case of an emergency of unknown or doubtful cause, the wearer should be rushed to the medical clinic rather than to a regular hospital.

Testing of workers for under-river work already is under way, with actual tunneling operations scheduled to start sometime this month. As the major portion of the tunnel will be constructed under 15 pounds of pressure, workers will be allowed to spend only 3 hours in the tunnel at a time. A 3-hour period out of the tunnel will separate the two halfs of a 6-hour shift.

Work on the $100 million tube was begun September 25, 1952. Twenty-five contracts, totaling over $46 million, have been awarded to date. A force of 200 men for four shifts of around-the-clock tunneling, six days a week, will be required for the actual under-river work.



▲ A cutaway model of the decompression chamber in use at the medical clinic provided for crews constructing the new third tube of New York's Lincoln Tunnel. The front compartment is for testing resistance to compressed-air conditions; the rear section for treatment of compressed-air illness.

NEW CHEVROLET TRUCKS

have what it takes to boost efficiency and bring down costs!

In the next three paragraphs you'll find a few good reasons why you can get more work out of a Chevrolet truck and save money doing it.

INCREASED POWER IS THE FIRST BIG REASON

With Chevrolet's higher compression ratio you've got more power under the hood. Power that results in greater acceleration and hill-climbing ability. Faster starts and acceleration over the day's work save valuable time and increase over-all efficiency. Check the gas mileage, too. With this higher compression ratio, your Chevrolet truck registers *more miles on the job* for each tankful of gas. That's where you start to save money.

BUILT-IN RUGGEDNESS SAVES EVEN MORE

The strength and stamina of more rigid frames, and the special chassis features that pertain to each model—these combine to add extra ruggedness to your Chevrolet truck. Push it hard on the rough jobs; keep it going over long schedules—you'll still find your upkeep costs lower and your Chevrolet trucks lasting a lot longer.

ONE LAST POINT—and maybe the most important to you—you'll find Chevrolet's line of trucks priced the lowest of all! Talk over your needs with your Chevrolet dealer. He'll be glad to give you the facts about the best model for your job. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

MOST TRUSTWORTHY TRUCKS ON ANY JOB! CHEVROLET

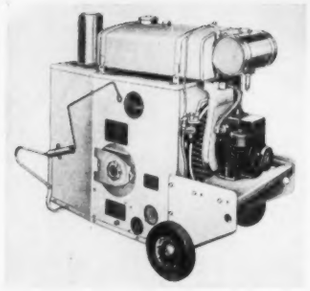
CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

**Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.*

GIVE TO CONQUER CANCER

AMERICAN CANCER SOCIETY



A special kit supplied with the new Herman Nelson Utility model air heater makes it possible to convert the unit from electric-motor to gasoline-engine power quickly.

Air Heater Features Power Changeover

■ A portable air heater that can be converted from electric-motor to gasoline-engine power quickly with a special kit is on the market. The advantage that the Herman Nelson Utility model heater offers is that it can be used as effectively on sites without electricity as on sites with it. It can be either oil-fired or gasoline-fired, and is safe for indoor work because fumes are vented outside the work area.

From 75,000 to 425,000 Btu of clean hot air is supplied by the heater, which is a self-contained unit with no ignition electrodes, transformers or relays. Heat output may be regulated, and the large-capacity fuel tank allows overnight operation without refueling.

Among recommended uses are temporary space heating, protecting concrete pours, preheating or thawing materials, and keeping workmen warm.

For further information write to the Herman Nelson Div., American Air Filter Co., Inc., Moline, Ill., or use the Request Card at page 18. Circle No. 598.

Line of Oil Burners

■ Literature on its line of oil burners is available from the Silent Glow Oil Burner Corp., 850 Windsor St., Hartford 1, Conn.

The leaflet features a cutaway view of a typical burner, with special features illustrated. Among these are a Westinghouse motor built for long-hour duty; a standard internal gear-type pump, combined with a strainer and regulating valve; and special cup-shaped bolts that realign the pump, fan, or motor should a part need replacing.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 652.

Smokeless Salamander

■ Literature is available on the oil salamander offered by C. R. Daniels, Inc., Daniels, Md. The Danco salamander produces 125,000 Btu burning less than a gallon of kerosene per hour. Features listed include smokeless heating and a square-bottom design that makes the unit difficult to tip. The salamander burns up to 20 hours without refueling.

The folder explains how to set up and fire the salamander and how it operates.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 653.

Lightweight Vibrator

■ A new lightweight high-speed concrete vibrator is being produced by the Stow Mfg. Co., 40 Shear St., Binghamton, N. Y. Mounted on a lightweight base, the JB vibrator can be easily carried around on the job.

The machine operates at from 6,000 to 9,300 vibrations per minute and has a 2-hp 4-cycle air-cooled engine. It has a ball-bearing eccentric belt tensioner and a special spring lock for fastening the flexible shaft to the countershaft.

The new unit is furnished with ⅜-inch-diameter flexible shafting—the same size used on larger Stow machines. Standard equipment includes one Model 1600 (1⅝ × 10-inch) vibrator head. Also available are heads in sizes of 2 × 10 inches or 2½ × 10 inches. Different combinations of 7, 14, or 21-foot flexible shafts can be furnished to give total lengths up to 35 feet. The vibrator head can be removed and attachments screwed on for wet or dry grinding of concrete.

For further information write to the company, or use the Request Card at page 18. Circle No. 542.

Stow's new lightweight vibrator.

NO TIME FOR DOWNTIME. Until this reservoir is completed, residents of Olathe will be paying premium rates for drinking water. That's why Contractor Lee Yerington says: *"On this dam I need plenty of power with a very minimum of downtime, and that's exactly what I get with my* INTERNATIONALS. *Take that TD-24 pusher, for example. 3500 hours on the meter and it still has original rails and never has had a major overhaul."*

"I needed durability ...my INTERNATIONAL'S delivered"

Contractor solves water shortage for Olathe, Kansas, with fleet of six INTERNATIONAL crawlers that never faltered in building a big dam and 160-acre reservoir

Water exporting business in Kansas City, Missouri, is due for a sharp slump due to the loss of 5,593 cash customers, the residents of Olathe, Kansas.

For many months past the thirsty population of Olathe has been supplementing the city's inadequate water supply by buying water by the tank car from Kansas City, but this condition is being rectified, and in a hurry.

The Yerington Construction Company, Parksville,

A TRAP FOR CEDAR CREEK is shown taking shape as the INTERNATIONAL TD-24 and B-170A scraper begins another loading cycle in the bottom of the new reservoir.

SOME BIG REASONS WHY earthmoving on this 450,000-cubic yard project moved at such a lively pace are apparent in this photograph: TD-24 speed that hauls heaped loads to the dam site at fastest traveling speeds. The positive rolling ejection feature of the INTERNATIONAL B-170A scraper spreads faster and completely cleans the bowl in the process.

New Crane Carrier Rated at 45 Tons

■ A new 45-ton crane carrier, one of the largest ever built, has been announced by the Dart Truck Co., 2621 Oak St., Kansas City 8, Mo. The new unit is powered with a 240-hp Waukesha gasoline engine. It is equipped with a Fuller 10-speed transmission and has a 100,000-pound rear tandem axle. Single front and dual rear tires are 14:00 × 24 in size.

Among the construction features of the new carrier are a box-girder frame and single box outriggers with beams extendible to 15½ feet. A one-man cab offers the operator exceptional visibility, and Vickers hydraulic steering combined with a Ross steering gear is reported to make the large unit easy to maneuver.

The new Dart 45-ton crane carrier is powered by a 240-hp Waukesha engine.

The over-all length of the carrier is 29 feet, and the width is 10 feet, 6 inches. The gross weight without upperworks is 50,000 pounds. Dart also provides optional wheelbases to meet specifications.

The company also offers a new tandem full-floating rear axle with a 125,000-pound rating for a 50-ton carrier. Diesel engines are optional.

For further information write to the company, or use the Request Card at page 18. Circle No. 544.

New Electronic Scales Weigh Trucks in Motion

■ A new type of electronic highway scale that weighs and records both single and dual-axle truck weights while vehicles are in motion, has been developed by Cox & Stevens Aircraft Corp., Wallingford, Conn. With this system drivers do not know when or where weighing takes place; it is therefore particularly useful for highway research purposes and for enforcement of maximum load regulations.

The new TR-1 weighing unit consists of two parts. The highway part of the unit is a narrow platform just wide enough to catch each wheel of the axle. This platform, installed at paving level in the traffic lane, is supported by electronic weighing cells that instantly transmit the weight to a remotely located indicator on which the weight is recorded automatically. At normal highway speeds an axle will be on this platform for only 1/30 of a second.

The electronic highway scale may be used to record axle weights, truck speeds, and axle spacings, without making counts or samplings.

Used in conjunction with an overload detector, the TR-1 will allow legally loaded trucks to bypass official state weighing stations to cut down delays.

For further information write to the company, or use the Request Card at page 18. Circle No. 543.

Concise Descriptions Of Types of Insurance

■ A booklet giving general information on insurance and bonds available through the Hartford Accident & Indemnity Co., Hartford 15, Conn., may be obtained upon request.

The literature provides short descriptions of the features and uses of many kinds of insurance. Among types covered are: automobile; accident; accounts receivable; bid bonds; comprehensive liability; contract bonds; dishonesty, disappearance and destruction policy; employer's liability; fidelity bonds; and manufacturer's and contractor's liability insurance.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 654.

Horton Co. Appoints

George S. Chiaramonte, the former Horton Chuck Division sales manager, has been appointed to the newly created position of general sales manager of the E. Horton & Son Co., Windsor Locks, Conn., manufacturer of lathe chucks and bituminous-surface and general-utility rollers.

In this capacity, Mr. Chiaramonte will direct sales for both the Horton Chuck and the Gabb Special Products divisions of the company.

Missouri, started construction of a new dam and 160 acre reservoir 2½ miles west of Olathe, and early in 1955 the city expects to be out of the water importing business.

Lee Dell Yerington is using a total of 21 pieces of equipment including 6 INTERNATIONAL tractors and scrapers to move 450,000 cubic yards of dirt and 60,000 cubic yards of rock on this hurry-up project, and here's what he says about his earthmovers:

"I like my INTERNATIONAL *equipment better than any other I have on this job—and for several reasons. I need plenty of power and plenty of durability and my IH crawlers deliver."*

Discover for yourself what this contractor has learned about how INTERNATIONAL crawlers and equipment deliver outstanding power and performance when the chips are down. Just call your INTERNATIONAL Industrial Power Distributor for your demonstration today. He'll bring the IH equipment you need to your job site anytime so you can get the lowdown on the IH rigs that mean more profitable business for you from here on in.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

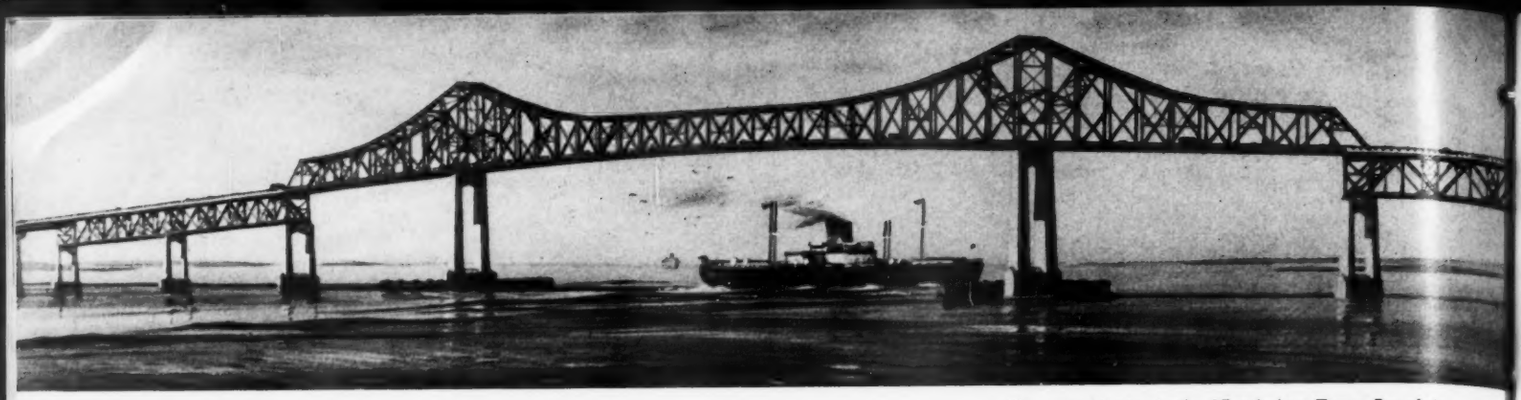
ONE OF FOUR TD-18As the contractor used to hold a 7,000-cubic yard daily production average on this job is shown dozing dirt for a small temporary reservoir. This structure will be used in conjunction with the small natural lake as a reservoir until the new reservoir is completed.

UPGRADE WITH A HEAPED LOAD presents no problem for the Yerington's TD-24 with matched B-170A scraper hauling a solidly packed payload of 21 cubic yards.

INTERNATIONAL HARVESTER

INTERNATIONAL

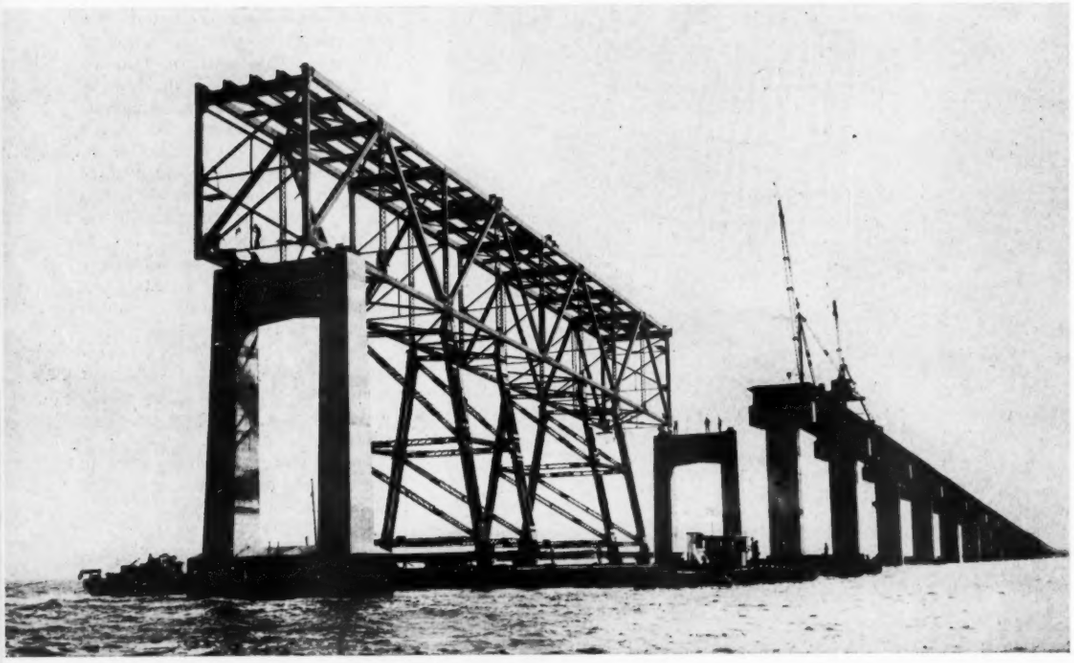
FOR EVERY MOVE IN EARTHMOVING



The central bridge in the 15-mile-long Tampa Bay chain of causeways and bridges is 5,621 feet long. The 864-foot cantilever span in the middle is flanked by through-truss anchor arms, deck trusses, and girders.

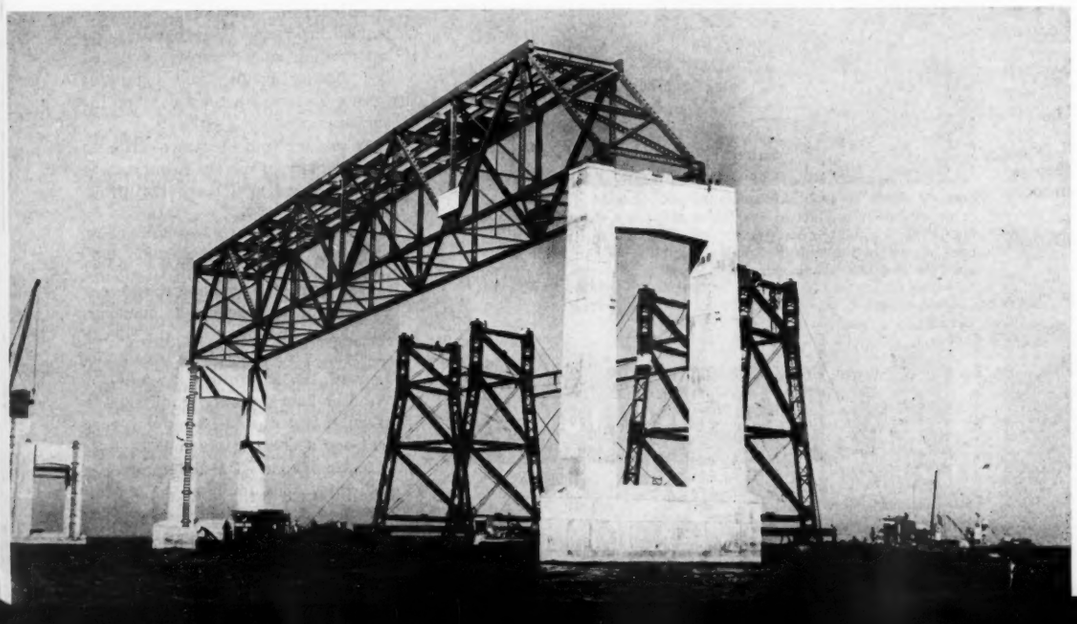
Barges Float Assembled Truss Spans Into Place

One of four pre-formed deck members serves as falsework for erecting anchor arms of Tampa Bay cantilever bridge



A 289-foot-long assembled deck truss is floated onto its piers in Florida's Tampa Bay. Twin barges tied together with steel beams and wire rope carry the truss on a steel frame. Water is pumped into the barges to lower the frame and bring the span to rest on the piers.

On the other side of the center cantilever portion of the bridge, another deck truss has been positioned and anchored to the piers. The floating frame moves out from underneath to return to the assembly dock.



FOUR ASSEMBLED deck-truss spans, each one nearly 300 feet long, were floated into place earlier this year in one of the more spectacular phases of construction work on Florida's new Tampa Bay Bridge.

The 15.2-mile-long structure, completed the latter part of this summer and officially opened with ceremonies Labor Day, is a sweeping chain of causeways and bridges linking St. Petersburg with highways and communities across Tampa Bay to the southeast. (See C&E April, 1953, pg. 26).

Although the basic erection technique was similiar to that used three years ago on the Chesapeake Bay Bridge in Maryland, several new features were added. In both cases, however, deep water and high winds made floating-in preferable to the conventional method of erecting steel on temporary pile-supported bents.

On the Tampa Bay job, the trusses were easily assembled on special temporary falsework built next to the bridge at the end of the girder spans. A 15-ton traveling stiffleg derrick set the steel from its position on top of the last two girders.

Another feature was the use of the fourth assembled truss as falsework for erecting the two through-truss anchor arms of the cantilever bridge. Instead of the fourth truss-span being floated onto its own piers, as was done with the other three, it was first lengthened about 30 feet on each end, fitted with erection bents on top, and then floated into a temporary position below the south anchor arm. Steel for the 360-foot arm was then erected on top, the modified span was floated out and around to the north arm, and set in position. When the erection of the south arm was completed, the span was stripped of its special extensions, and floated onto its own piers north of the cantilever.

High-Level Cantilever

The American Bridge Division began the $3,873,000 superstructure job in May, 1953, and had most of the 12,000,000 pounds of steel in place by this summer. The center span was

closed July 1 and swung the following day. The highest point on the bridge is the center span of the cantilever, which is 864 feet center to center of bearings, and has 150 feet of vertical clearance. Approach spans on each side are identical, consisting of one 360-foot anchor arm, two 289-foot deck trusses, six 140-foot girders, and six 100-foot girders.

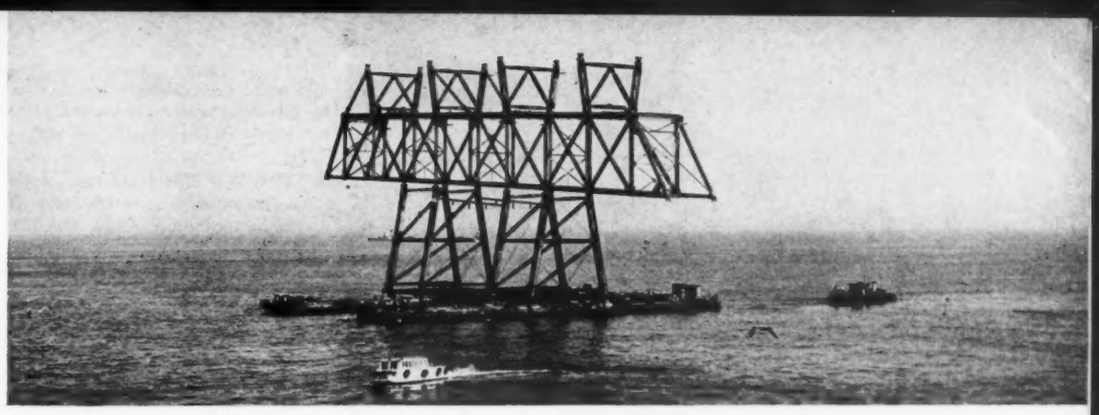
Steel was fabricated in Birmingham, Ala., and shipped by rail to a dock near Tampa. The conventional method of starting erection work would have been to set the first 100-foot girders at each end from a derrick boat, and then erect travelers on top. American Bridge simplified this procedure by assembling the two girder spans at the dock, erecting a traveler on each, and then floating them out and in place as complete units.

Derricks and cranes were in short supply during most of the job, and the contractor found it more economical to shift them around than to have new ones shipped from distant parts of the country. At the yard in Tampa, the contractor used a 35-ton stiffleg and a 50-ton Browning locomotive crane for handling.

A 50-ton traveler was started on the south end of the bridge and used to erect all girders and assemble the first truss on the dock. It was later replaced with a 15-ton unit that erected the other three truss spans. At the same time, a 20-ton traveler on the north side set all of the 100-foot girders and then teamed with a rented derrick boat to erect the 140-foot girders.

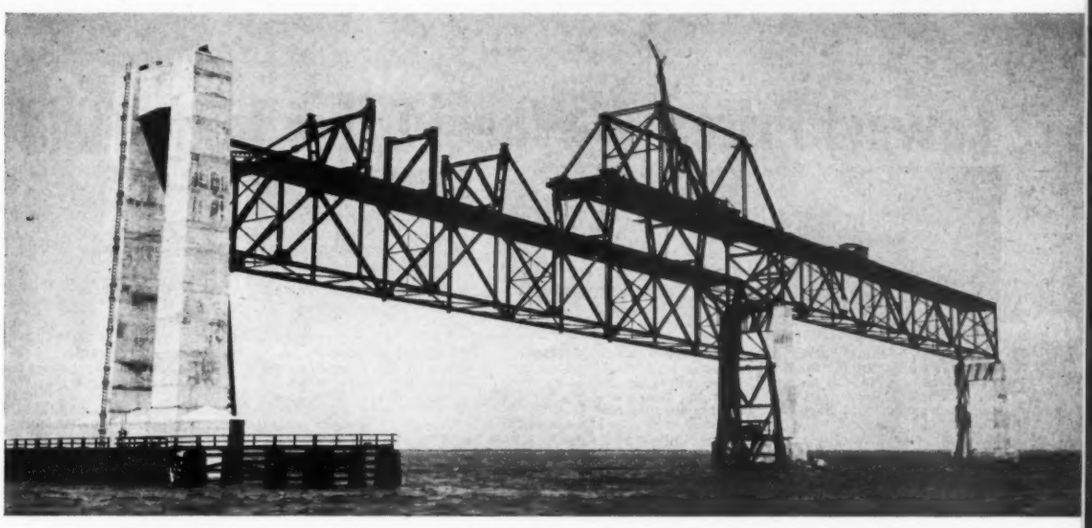
Assembly Dock

As the last few girders were being erected on the south side, 10-inch H-piles were driven into the bay bottom to support the truss assembly dock. The floating frame, which rested on the pile caps, consisted of two steel double bents about 100 feet on center. Each double bent was cross-braced and tied together with 1-inch wire rope. One bent was made higher than the other to provide the required 5 per cent grade of the spans.



The fourth truss, with an extra panel at each end and temporary bents on top for erecting the anchor arms, is towed to its temporary position under the ends of the span. Stripped of the extra portions, it will finally be set in place.

Below, the modified truss in position for the job of erecting the anchor arms. During this operation, the truss is supported on temporary bents that rest on the pier footings. Part of the anchor arm already is assembled. *C & E Staff Photo*



When the truss span was completely assembled on the double-bent floating frame, the barge unit was brought in to float it away. The 200-foot-long × 34-foot-wide barges—one for each double bent—were tied together, 108 feet center to center, with steel beams and ⅞-inch wire rope. Filled with water, the barges were maneuvered under the floating frame and then anchored. Final positioning was done by two American and two Clyde 2-drum hoists pulling on 2,500-pound anchors.

When the required number of blocks and wedges were placed between the barges and the frame, the water was removed with four 10-inch pumps, the barge unit rose, and the truss was floated. To provide further bracing during the trip to the piers, the frame was tied to the barges with sixteen 1½-inch wire-rope guys and turnbuckles.

Towing

When the frame had been securely tied to the barges, the 475-ton mass of steel was towed close to the supporting piers, where the hoists did the final positioning. Generally the trip took about three-quarters of an hour. Pumping out the required 1 foot 9 inches of water from the barges took half an hour.

When the truss had been lowered on its supports, the barge and frame returned to the dock, the frame was set back on the pile caps, and the barges were put back to work hauling steel until they were needed for a new floating operation.

This procedure was used for each span, except the last one, which was first lengthened to fit between the anchor piers and had five falsework bents erected on top. The extended span was floated in and set on temporary steel bents supported on the pier footings.

Anchor Arms

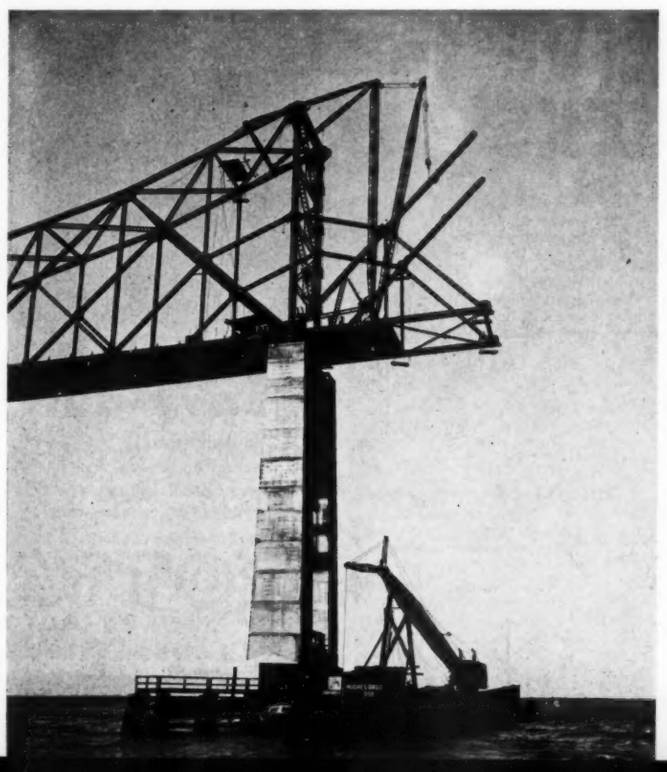
A 15-ton traveler erected the first third of the south anchor arm. The increasing height of the panels, especially over the piers, soon demanded a larger rig, however. A 30-ton guy derrick was then brought in, but because of its unusual position it had to be anchored back with stifflegs instead of the conventional guys. It had a 110-foot mast, a 100-foot boom, and was operated by an American three-drum hoist powered by a General Motors diesel. This rig erected as far as the fourth panel beyond the pier, where a small 10-ton guy derrick took over.

The north arm was erected the same way, with a 15-ton derrick setting the steel in the main span. Final pieces at the center of the long cantilever were jacked into position in the conventional manner. Final closure was accurate to within ¼ to ½ inch.

Bridge Closes Gap

Tampa Bay Bridge extends 15.2 miles from Maximo Point in the city of St. Petersburg to a point on the opposite shore a few miles north of the cities of Palmetto and Bradenton. More than 11 miles is over water.

Completed at a cost of $22,250,000.



High panels over the piers require a 30-ton guy derrick, tied back with stifflegs, for the job of erecting steel. An American three-drum hoist powered by a General Motors diesel operates the derrick, which is equipped with a 100-foot boom. *C & E Staff Photo*

The 15-ton traveler atop the girder at left of center prepares to assemble a deck truss on the floating frame just below. At upper right is the unique rig the subcontractor on the concrete deck used to support workmen stripping bottom forms.

the bridge closes the last gap in the Gulf Coast Scenic Highway—U. S. 19—which sweeps down from the Great Lakes, crosses the new bridge for a connection with U. S. 41, proceeds to Miami, and on to Key West.

The project is broken down into 11 structural sections, six of which are paved embankments varying in length from 3,700 to 20,000 feet and having a total length of 54,024 feet. Alternating with these embankment stretches are five bridge structures, which vary in length from the 336-foot bridge over Terra Ceia Bay to the 22,373-foot structure over the Tampa Bay ship channel.

The embankments, placed by hydraulic dredges, are paved with a 24-foot roadway which has 8-foot stabilized shoulders on each side. Due to the extreme vulnerability of the area to hurricanes, growth of shrubbery is encouraged, although none has been purposely planted. The crown of the roadway is 7¼ feet above mean low water, except at bridge approaches. More than usual care was taken to provide protection against erosion from tides and normal storms by setting concrete bulkheads at the bridge ends and the more critical parts of the embankments.

Roadways on all bridge and trestle structures are 28 feet wide with sidewalks on both sides varying in width from 2 feet on the steel spans to 3 feet on the concrete trestle spans.

The central span of the bridge, where the deepest sections of the trusses are 250 feet above the bay, supports a 28-foot roadbed and provides a navigation clearance of 800 feet and a minimum vertical clearance of 141.5 feet above mean low water to admit the largest of ocean going vessels. The central fixed cantilever span of 864 feet is the ninth longest in the nation, and with its anchoring truss and approach spans totals 5,621 feet—more than a mile. Steel and concrete trestles forming approaches to the cantilever span are 16,752 feet over all, the Pinellas trestle being 5,856 feet and the trestle on the Manatee County extension being 10,896 feet.

Three smaller bridges between causeway fills leave small boat channels open.

The two largest piers supporting the central cantilever span each contain 8,800 cubic yards of concrete and are set on 360 steel piles sunk 100 feet below the bay's bottom. The 32 piers of the central span are spaced from 100 feet to 864 feet apart, allowing free passage of tidal waters. More than 16,000 tons of steel were used in the central span alone. From 500,000 to 1,000,000 cubic yards of sand were pumped per mile of causeway.

Personnel

E. Nimmergood was superintendent and E. Powers was field engineer for the American Bridge Division. P. Hakman was resident for the consulting engineers, Parsons, Brinckerhoff, Hall & Macdonald, New York, N. Y. THE END

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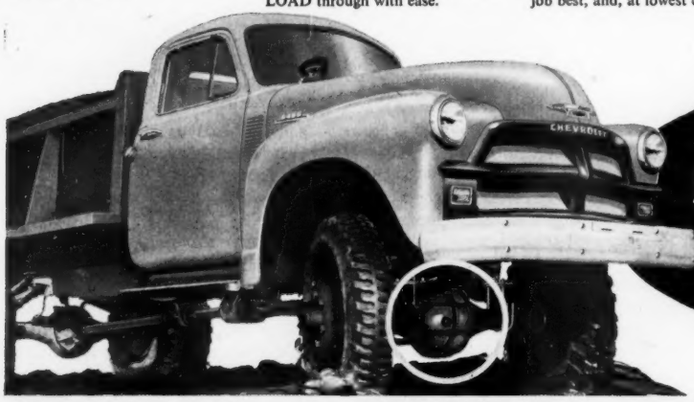

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Parts and service for NAPCO Powr Pak are available at any Chevrolet dealer from coast to coast. All replacement parts for the entire differential of the front axle assembly are available at any Chevrolet Dealer.

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NAPCO 4-wheel drive is installed without cutting, welding or altering cab or frame. It is bolted to the frame and can be removed at will. It is simple to transfer it from a worn truck to a new one.

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The normal easy turning and handling characteristics of Chevrolet trucks are not affected by the NAPCO Powr Pak installation. At cruising speeds over highways there's no trace of whip or weave... no fighting the wheel. And, when the going gets tough "off the road", just a flip of a lever gives you finger tip control of tremendous extra traction power ... no stopping or declutching necessary to shift.

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A 4-WHEEL DRIVE "PICK UP"
Now, for the first time you can have a Chevrolet "pick-up" with 4-wheel drive for the extra traction power to "go anywhere". Chevrolet trucks equipped with NAPCO Powr Pak get you in and out of jobs no matter how tough the going is. And, you get more than just transportation . . . you get a truck that takes you PLUS a full load through the toughest off-the-road terrain with ease. Then when you get out onto the highway, you have ease of handling at cruising seeds. No costly "down time" when operating Chevrolet trucks equipped with NAPCO 4-WHEEL DRIVE!

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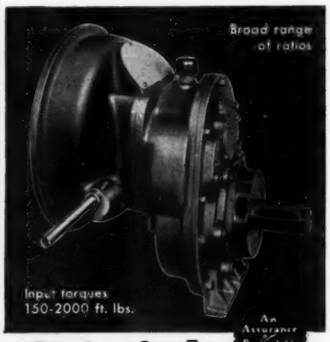

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COTTA HEAVY-DUTY TRANSMISSIONS

"Engineered-to-order"

The Model DD-30 clay digger made by Davey Compressor Co.

New Clay Digger Model

■ A new heavy-duty clay digger is announced by Davey Compressor Co., N. Water St., Kent, Ohio. The Model DD-30 is said to be efficient for excavating stiff clay and hardpan, as well as concrete and shale. Its latch-type chuck retainer permits a quick change of working steels such as clay spades, flat picks, moil points, chisels, asphalt cutters, frost wedges, dirt tampers, and others.

Features include a new type of wafer-plate valve with differential porting. Also, the tool's chrome-plated cylinder bore is said to more than double effective working life. Another feature is a built-in lubricator which gives pressure lubrication to all moving parts. Net weight of this model is 31 pounds.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 619.

Front-End Loader

■ A new heavy-duty loader designed for gasoline and diesel-powered Fordson Major tractors is announced by Wagner Iron Works, 1905 S. First St., Milwaukee, Wis.

The new Model W7-FM is capable of handling 2,000-pound lifts and ½-yard loads. It is powered by the Wagner independent hydraulic system with down-pressure side cylinders and twin double-acting attachment-control cylinders.

Of step-in design, the unit is reported to have fast lift and quick dump, combined with an unobstructed view of materials being handled.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 541.

The new Wagner ½-yard loader for gasoline and diesel-powered Fordson Major tractors.

NEW JOY DRILL SAVES OVER 13½¢ A CU. YD. ON NEW YORK THRUWAY JOB

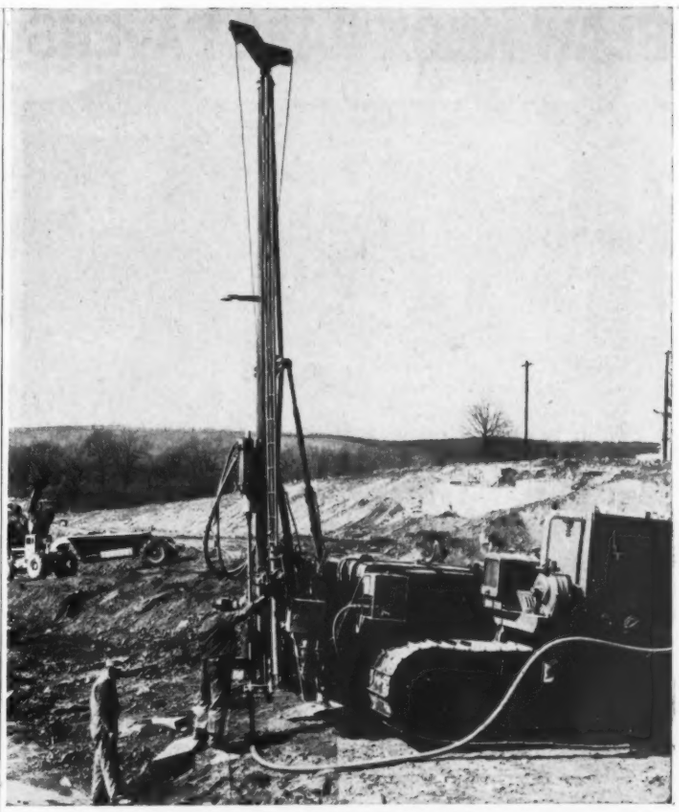
Contractor Pulls Drilling Costs 'Way Down With Joy Challenger Hammer Drill

On a section of the New York Thruway job, a large contractor compared drilling costs when using a new Joy Challenger Drill and 4" wagon drills.

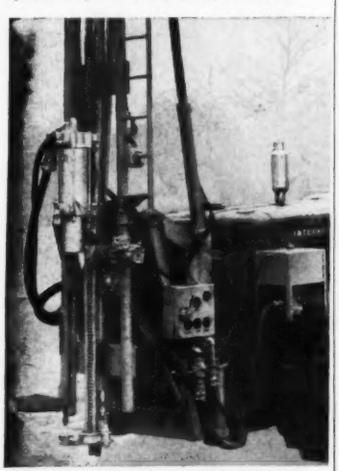
He drilled 20 to 24 ft. holes in hard limestone, allowing 10% hole loss to break to grade. Results (at right) indicated total saving with the Joy Challenger of 13-7/10¢ a cubic yard!

The revolutionary Challenger is self-propelled, very mobile. Each of three models is equipped with a Joy TM-500 Hammer Drill—largest ever built. Hole size is to 4½" dia., 50' deep.

Full details in free Bulletin 87-U. Write to *Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



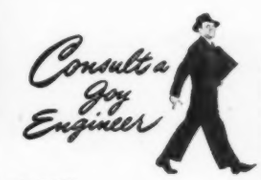
The revolutionary, new Joy Challenger Drill at work on the New York Thruway. This amazing drill reduced contractor's drilling costs 13-7/10¢ a cubic yard!



Closeup of the powerful Joy TM-500 Hammer Drill as used on all three models of the Joy Challenger.

OPERATING FIGURES REVEAL SAVING:

ITEM	JOY CHALLENGER	4" WAGON DRILLS
Hole Pattern	10 x 12	6 x 6
Footage per 8-hr. shift	225	275
Yards per 8-hr. shift	900	330
Yards broken per ft. of hole	4	1.2
Labor per yd. at $40.40 shift	$.045	$.122
Steel and bits per yard	.09	.06
Fuel & lube oil per yard	.10	.14
Drilling costs per yard	.235	.322
Saving in drilling cost (.322—.235)	**.087**	—
Saving in powder per yd.	**.05**	—
TOTAL SAVING PER YARD	**.137**	



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These heavy-duty time and labor saving units handle concrete *without forms*, asphaltic concrete and any kind of aggregate. They spread and finish concrete up to 1½ miles per day . . . build earth shoulders at the rate of 200 tons per hour. Two sizes available to meet your needs. Send for Bulletin 2458.

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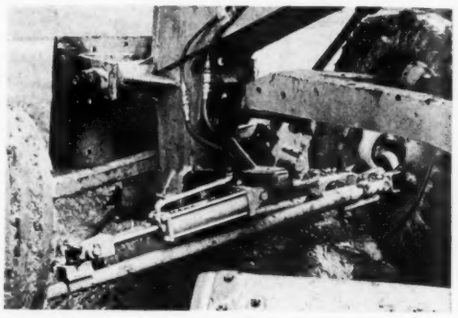
Offices in Principal Cities

Power Steering Unit for Motor Graders Controls Front Wheels to Hold Course

■ A full-time power steering unit for Caterpillar motor graders has been developed by Rivinius, Inc., Eureka, Ill. Caterpillar graders in the 12 and 112 (including the 9K) series can be fitted with one of two models offered. The unit consists of a Vickers hydraulic pump and a cylinder mounted on the front axle and controlled by a valve on the steering shaft. The high location of the valve keeps it out of the dirt for trouble-free operation.



This new Rivinius power-steering unit for Caterpillar motor graders has a hydraulic pump mounted on the front axle of the grader. The pump is controlled by a valve on the steering shaft.

All of the power to turn the wheels is supplied by the pump; a spring on the valve puts only enough tension on the steering wheel to provide the feel of steering. Road shock is completely eliminated.

The Rivinius unit automatically locks the front wheels in position, holding the grader on course, even over rough ground. This locking feature makes it possible for the operator to remove both hands from the wheel to handle control levers. Manual steering is still possible in the event of power failure.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 532.

Powered Hacksaw Cuts in Any Position

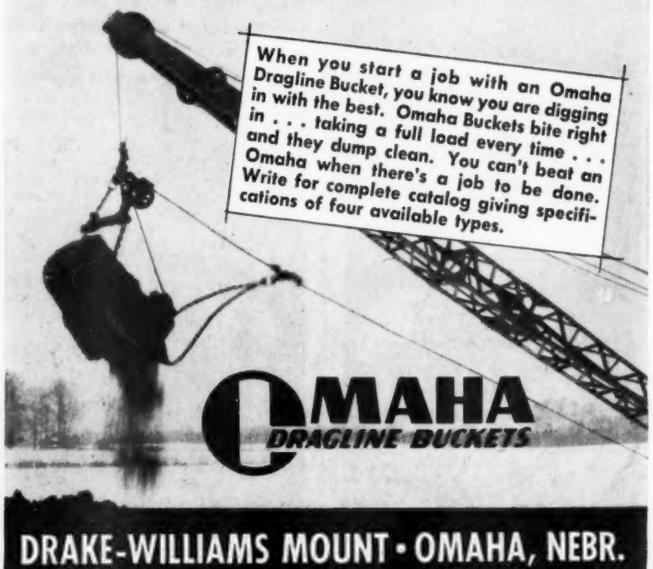
■ A 50-pound portable power hacksaw that can be taken out to the job has been placed on the market. The Hand-I-Hack saw is manufactured by Lipe-Rollway Corp., Emerson Ave., Syracuse 1, N. Y. It will cut metal, plastic, or fiber stock up to 3 inches in diameter at any angle from 45 to 90 degrees.

The Hand-I-Hack portable saw cuts in any position because the blade draw cuts and then lifts, making weights unnecessary.

The saw works on a new principle, by which the saw-blade draw cuts and then lifts on its return stroke. This eliminates the necessity for weights and enables the saw to be operated vertically, horizontally, or even upside down. With its work vise clamped to a stanchion or a pipe, the Hand-I-Hack is self-supporting, able to make repeated cuts with a tolerance of .01-inch square. Power comes from a 1/3-hp electric motor.

For further information write to the company, or use the Request Card at page 18. Circle No. 630.

Dig In with the Best


When you start a job with an Omaha Dragline Bucket, you know you are digging in with the best. Omaha Buckets bite right in . . . taking a full load every time . . . and they dump clean. You can't beat an Omaha when there's a job to be done. Write for complete catalog giving specifications of four available types.
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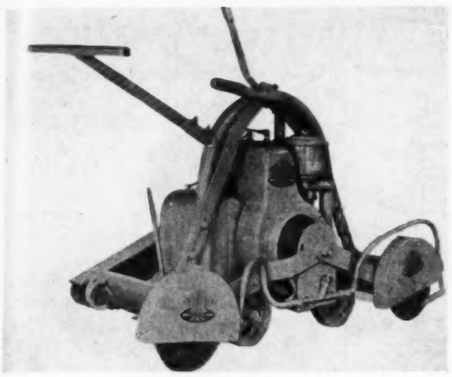
Two-Blade Concrete Saw Cuts Transverse Joints From Edge to Edge Without Turning Around



The new Cutcrete Junior joint saw, designed by Hurst Lewis, cuts a transverse joint from edge to edge, regardless of obstructions. The Trail blade begins the cut and the lead blade completes it.

■ For transverse-joint sawing jobs that are too small to warrant the use of 8 and 16-blade machines, Cutcrete has introduced a new 2-blade machine. The 2-blade arrangement makes it possible to make a complete transverse cut from edge to edge without turning the machine around, despite the presence of walls or other obstructions.

The Trail blade starts the cut right at the edge and makes most of the cut as the lead blade rides free. As the far edge is reached, the lead blade is lowered to complete the cut.

The new Junior joint saw is powered by a 14.6-hp Wisconsin engine and uses blades 10 to 14 inches in diameter.

For further information write to the Cutcrete Corp., 265 N. Vinedo Ave., Pasadena 8, Calif., or use the Request Card at page 18. Circle No. 616.

Device for Scrapers Saves Cable Breaks

■ A frequent cause of cable breakage on scrapers is raising the bowl or bringing the ejector foward until the stops meet while keeping the cable control clutch engaged; or making a sharp turn; or hitting a bump or dip. In order to relieve the operator from having to watch the ejector or bowl-stops and to prevent the operator from unintentionally allowing the stops to meet, Caterpillar equips its tractor-scraper combinations with a hydraulic cable saver. The DW20 and DW21 tractors teamed with the No. 20 and No. 21 scrapers are so equipped.

The cable saver consists of two hydraulic cylinders that are actuated by the bowl-stop or by an adjustable screw set out from the ejector stop, and two slave cylinders that automatically return the cable control lever to the disengaged position when actuated by a master cylinder. As the ejector or bowl approaches the stops, the adjustable screw or bowl-stop hits a lever on the master cylinder, causing it to hydraulically actuate the slave cylinder. The slave cylinder, thus actuated, pushes on an arm that is connected by mechanical linkage to the cable control lever. This returns the lever to the disengaged position before the stops can meet, thus preventing cable breakage.

For further information write to the Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 546.

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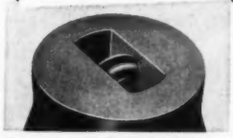
Your low cost production tool for
■ wrecking old buildings ■ smashing scrap metal
■ smashing old paving ■ secondary quarry breakage



Exclusive E-Z SWING steel eye, deeply imbedded in ball, gives better control; more cable protection. Special Release Hooks for "free dropping" also available.

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SIZES AND WEIGHTS SHIPPED FROM STOCK		
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1000 lbs.	3300 lbs.	6500 lbs.
1500 lbs.	4000 lbs.	8000 lbs.

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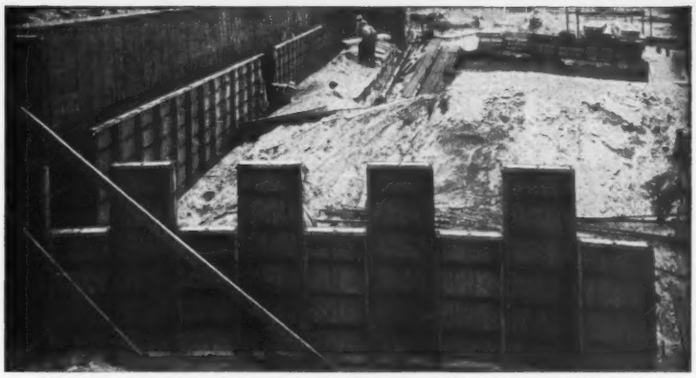

Alexander Hamilton Memorial, Chicago, Illinois, R. C. Wieboldt, General Contractor

Symons Forms with Steel Ribs

Curved 10′ wall is aligned without walers by using alternate 2′ x 6′ and 2′ x 4′ panels with plates top and bottom. Braced on one side only. Same panels reused for straight walls and battered walls. Form work follows form layout made by Symons engineering department from architectural plans.

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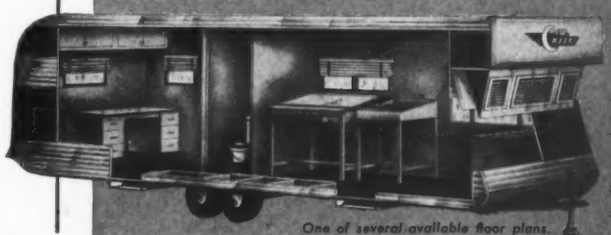

One of several available floor plans.

Units for:
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SHOPS
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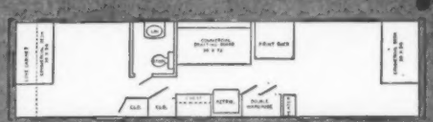

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MANAGEMENT

Can You Prove You're A Good Contract Risk?

By W. E. GUERIN, Assistant Secretary, Current Bond Department, American Casualty Co., Reading, Pa.

A contractor who distrusts banks shows poor business judgement.

JUST AS THE success of a contracting venture often hinges on the productive use of equipment, the weather, and countless other items, success in securing a contract at all may depend on the financial statement you submit to a contract bond underwriter or banker. The use of equipment is something you control completely. Weather is an intangible over which you have no control. Unlike both of these, your financial statement is something which you can control at least partly.

Even before you prepare such a statement, be ready to have underwriters carefully check you and your operations to determine your character, credit, and capacity. You should score high on all three. If there is a lack of character, with definite moral turpitude indicated, the company will probably not bother making further inquiries. Credit indicates your financial responsibility. Usually, your responsibility level is considered low if you have assumed contracts valued in excess of ten times your working capital. Your capacity is indicated by the degree of success you have had in completing

Turnpike tests Transmissions

Contractor D. W. Winkleman is building two stretches of the Ohio Turnpike . . . working in rough, wet cuts, his ten Model C Tournapulls are doing a major share of the 7,300,000 cubic yard excavating job. On this operation the distance from cut to fill is over a mile and a half . . . the Tournapulls make the round trip of over 3 miles in just under 22 minutes. Fuller Model 5-A-1120 Heavy-Duty transmissions *are putting every "Horse" of the 186 hp diesels into the job.* In this contest of "scrape . . . load . . . haul . . . return" Fuller 5-A-1120 transmissions gear the Tournapulls with the *right ratio* for each load and grade condition.

The performance of Fuller geared equipment working in every major industry in *all types of on- and off-highway service* has been so outstanding that leading truck and equipment manufacturers *standardize on Fuller transmissions* in their vehicles.

From more than 110 different models available for rubber-tired equipment from 100 to 400 hp; engines from 330 to 1440 cubic inches . . . there is a transmission *designed with your job in mind.* Specify a Fuller transmission for your equipment.

where horsepower really goes to work

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FENNEL INSTRUMENT CORP. OF AMERICA

Contractors should be prepared to submit a complete, accurate financial statement when seeking a bond

contracts comparable to the one you seek to undertake.

Once you are past this preliminary hurdle, your financial statement comes under the scrutiny of producers who quickly cut through the maze of figures to find your net current asset or working capital condition. This is the item on which contract bond underwriters calculate their risk.

Financial statements vary from company to company, but the mere listing of assets and liabilities lends to each a common denominator. If we take the accompanying sample statement of the John Doe Construction Co., Inc., and analyze it, you may at the same time be able to see how your individual statement will look and how it can be improved. This statement is in round figures for the sake of simplicity, but round figures are rare in such statements—for the obvious reason that it is next to impossible to turn out a true statement in round figures. Such a statement is more or less a product of guess work and has little to do with the figures in the company's books. Remember that underwriters cannot afford to deal in generalities. An accurate picture of your financial condition is essential.

The stated Working Capital in this sample statement, $35,000, is entered in the upper right hand corner, and is arrived at by deducting Total Current Liabilities of $40,000 from the Total Current Assets of $75,000. Underneath this item is the notation: True Working Capital—? By analyzing this statement, we will try to find the true working capital condition of the company.

FINANCIAL STATEMENT TO THE

American Casualty Company of Reading, Pennsylvania

Stated Working Capital - $35,000
True Working Capital - ?

Name: John Doe Construction Co., Inc.

Business Address: 44 Sunset Avenue (Street) Longview (City) New Mexico (State)

STATEMENT OF ASSETS AND LIABILITIES AS OF November 15th, 19 53
Insert Date. Otherwise statement will be returned.

This statement must be made up by Applicant, his or its Bookkeeper. Agents are not allowed to do this.

PLEASE GIVE EXACT FIGURES. A ROUND FIGURE FINANCIAL STA

Cash in Bank (per Schedule "A")	10	000	Notes Payable (per Schedule "J")		
Cash on Hand	5	000	(a) To Banks Regular	8	000
Certified Checks deposited with bids	2	000	(b) To Banks for Certified Checks	2	000
Stocks, Bonds, etc. (per Schedule "B")	15	000	(c) To Material Furnishers		
Accounts Receivable from completed contracts, including retainage and excluding claims not approved for payment (per Schedule "C")	8	000	(d) To Others (exclusive of equipment)		
Earned Estimates and Retainage on incompleted contracts shown by Engineers' or Architects' estimates (per Schedule "D")	16	000	Owing Sub-Contractors, Account of Retained Percentages and Current Estimates	7	000
Other Accts. Receivable (per Schedule "E")	3	000	Accounts Payable (per Schedule "K")	18	000
Notes Receivable (per Schedule "F")	7	000	(a) Not Past Due $ 14,000		
Materials in Stock not included in any item above (present value) (per Schedule "G")	9	000	(b) Past Due $ 4,000		
(a) Available for Contracts under way $ 8,000			Debts Due Officers or Employees (attach explanation)	5	000
(b) Other Materials $ 1,000			Other Current Liabilities		
Total Current Assets	75	000	Total Current Liabilities	40	000
FIXED ASSETS			Chattel Mortgages or Liens on Equipment (per Schedule "H")	4	000
Equipment at Book Value (per Schedule "H")	11	000	Mortgages or Liens on Real Estate (per Schedule "I")	20	000
Real Estate (per Schedule "I")	30	000	Bonded Indebtedness		
(a) Used for Business Value $ 30,000					
(b) Homestead Value $			All Other Liabilities		
(c) Held as Investment Value $			Total Reserves (per Schedule "L")	2	000
All Other Assets (explain fully if credit expected)			Capital Stock	10	000
Cabin Cruiser	17	000	Surplus and Undivided Profits	68	000
16 Cyl. "Playboy" Convertible	5	000	Total Liabilities	144	000
Pre-paid Insurance	6	000			
Total Assets	144	000			

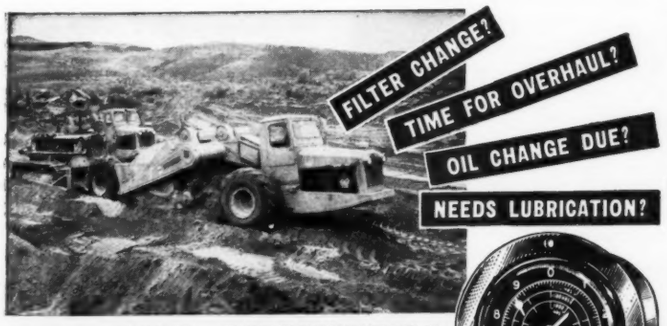
Have any of your notes, stocks, b... accounts rec... ...ained ... ...been ... ...ed, ...?

Cash Assets

The first item, Cash in Bank, is listed at $10,000. This can be verified by checking financial institutions on a special form, if time permits, or by a telephone call or personal visit to the bank. Not only can the underwriter be assured that the money was on deposit as of the date of the statement, but the company can also determine the average amount of monthly deposits—a more reliable indication as to the amount of money carried in the bank by the contractor.

This check on the bank balance of the contractor for each of the past three months also protects the surety company against contractors who place a large amount of money on deposit on the day the statement is drawn up, then withdraw the money a day or so after the bond has been executed.

At the time the bank balance is checked, the amount owing the bank —in this case $8,000—can also be verified. The bank is asked on what security the loan was made, the highest amount lent in the past, and the loan policy for the contractor in the



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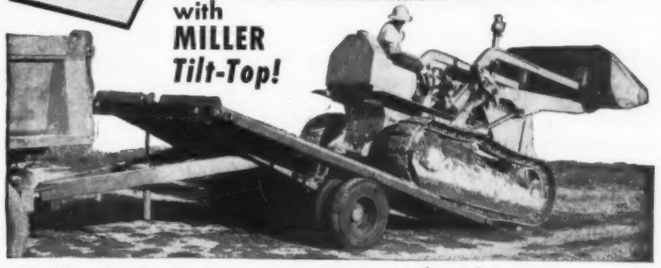
get MORE PROFIT from men and machines
...cut between-job travel time
with MILLER *Tilt-Top!*



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**Plus freight and Federal Tax.*

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Wise equipment purchases go a long way in establishing the contractor as a good risk.

(Continued from preceding page)

future. The bank's recommendation is not final. Although it is rare, a bank may recommend a contractor when the contractor is either greatly indebted to the bank or seems to be in an over-extended position.

The next item, Cash on Hand, is listed at $5,000. This seems quite high, since it is equal to half the cash which the company has on deposit in the bank. Inquiries are in order when cash on hand is out of proportion to the company's financial condition in general. The item might be perfectly valid if the contractor had been paid for work performed and did not have time to deposit money in the bank. Or he might distrust banks and keep large sums of money in a safe deposit box or in his home. While the latter case is a rarity, it does happen. This contractor would most likely be declined a bond, however, since this is the type of contractor who shows poor business judgment or who may be trying to hide the money for another reason. If the contractor's cash on hand is large, he should be willing to show the checks or items making up the figure. A refusal lessens his chances of securing a bond.

Certified Checks with Bids

On the statement, Certified Checks Deposited with Bids amounts to $2,000. A contra-item to the right shows that this check was borrowed from the bank for the purpose of entering a bid where a certified check was called for in lieu of a surety company bid bond. One item offsets the other. If there were no contra-item, there might be a question of whether the $2,000 represents money owned by the contractor in addition to the two preceding cash items. If the certified check were part of the cash items, it would not be counted as additional working capital. If large, the check would call for further investigation.

Stocks and Bonds are listed at $15,000. Credit is not given to an investment item which cannot be converted readily into cash. In the case of John Doe Contracting Co., Inc., only $3,000 in United States government bonds is allowed. The remainder was found, after investigation, to have gone for an investment in an unsuccessful oil exploration company.

Moving to the next item, Accounts Receivable from Completed Contracts, there is an entry of $8,000. This figure is not accepted at face value. The first items making up the total are due from the State of New Mexico and a city. State and city finances being good, these two items are accepted as being collectible. If the work had been done for a private owner rather than federal, state, or local governments, it would have been necessary to investigate the financial standing of the debtor to determine his ability to meet the payment. Part of this money, $3,000, was due from the Trustees of Longview Church for the construction of a church building. Moreover, since the money was due September 30, 1953, and was still unpaid as of the date of this statement, November 15, 1953, it is evident that something is wrong. An investigation uncovered the fact that the church ran out of funds and the John Doe Construction Co., Inc., will most likely have to wait a long time for its money. Naturally, this item cannot be included as a current asset.

This is not an unusual item in a contractor's statement. Frequently, companies run into financial difficulty when they assume church con-

Capacity of cement plant lifted 77% with the help of U. S. Rubber belting

View of new conveyor gallery coming from No. 2 primary crusher. This cement plant uses over a mile of U.S. Belts (10 belts in all)—to handle crushed limestone rock, wet filter cake and coal.

View of U.S. Giant Style YN Conveyor Belt carrying crushed limestone rock.

The recent expansion and modernization of a midwest cement plant lifted capacity 77%, from 4500 barrels to 8000 barrels a day. During the planning stage, United States Rubber Company's 3-Way Engineering service got on the job. By working with engineers of the conveyor system and engineers of the cement plant, the most efficient system to handle the increased capacity of the plant was designed and built. In this case "U. S." engineers recommended U. S. Giant® Style YN Conveyor Belting utilizing nylon for troughability and superior impact resistance. The "U.S." 3-Way Engineering service is available for any materials-handling problem. It is a service that will always produce an efficient low cost haulage system, whether the installation is large or small.

The "U. S." belting line contains a belt for handling any type of material. Whatever your haulage problem may be, U. S. Conveyor Belting is obtainable from your "U. S." distributor. Or you may get in touch with any of our 27 District Sales Offices or write address below.

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tracts and then find they cannot collect the money because of unpaid pledges. Contractors should make sure in such cases that the bill can be paid either in cash or through a construction loan made through a responsible financial institution.

Under Earned Estimates and Retainage on Incompleted Contracts, there is an amount of $16,000. Two of the items making up the total are due from the State of New Mexico; the third is due on a private contract. The sums due from the public body are considered collectible, but the private contract, on which $5,000 was due, must be investigated.

The $3,000 under Other Accounts Receivable is found to be due in a little more than a year from the date of the statement. This automatically eliminates the sum from current assets. In addition, the money is due on a loan to a needy relative, and there is doubt that the money will be available even when it becomes due. Such questionable accounts receivable are not considered. If the contractor had had a separate branch of his business dealing in ready-mix cement or other supplies, the account would have been allowed in full.

Notes Receivable amount to $7,000. Since notes are payable over a long period of time and cannot be made available in the form of cash, they are not generally considered current assets. In this case, the money is due on a loan secured through a real estate mortgage. While it may be a safe investment, the money cannot be had immediately for working-capital purposes. Unless there is enough proof that the money would be available, the note would be thrown out of the statement.

Equipment

Materials in Stock, valued at $9,000, are divided into (a) materials available and (b) materials not available for contracts under way. If all the materials are on the job sites, the amount is allowed. The amount is not allowed if the contractor does not have the material, since he would have to dip into current assets to make the purchase.

Equipment is valued at $11,000. On the right hand side of the statement, there is a chattel mortgage of $4,000 against the equipment. Rarely, if ever, can equipment be considered a current asset. The rare exception is when a contractor is about to sell a machine he no longer needs. He should have sufficient equipment for contracts under way and any new contract he intends to bid. If he does not, money for machines must come from current assets, diminishing his working capital position. While equipment is necessary for the conduct of the business, it cannot be considered the equivalent of cash. Some contractors own more equipment than they need, and so their cash position suffers.

For Real Estate for Business Purposes, the John Doe Construction Co., Inc., has entered $30,000. However, the liability side of the statement shows a mortgage of $20,000 against this property. The contractor has injured his working capital condition by buying too much real estate and, since some of it is mortgaged, it is doubtful if he could raise an additional loan on the property. If real estate is in good condition, is favorably located, returns a steady income in the form of rent, and is not too heavily mortgaged, it may be considered a secondary asset. Only sometimes is a contractor able to sell real estate for working capital. It generally takes a long time to dispose of

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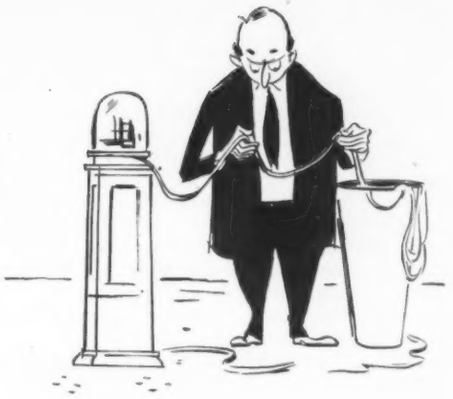

Underwriters are wary of giving credit to investment items not readily convertible to cash.

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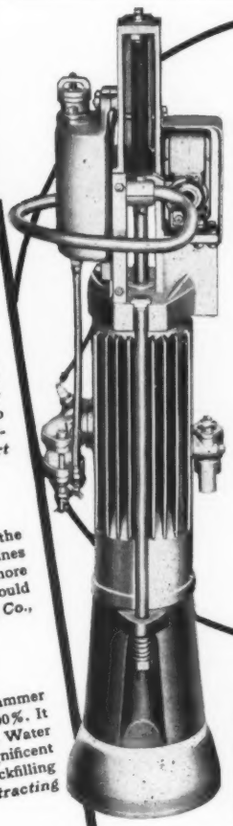
TEXAS ALUMINUM PLANT
"We compacted 380,000 cu. yds. of clay fill to 95% with twenty Rammers in six months. No other equipment would produce required compaction and only the Barco Rammer permitted us to finish the job on schedule."—*Consolidated Western Steel Division, Port Lavaca, Texas.*

CALIFORNIA PROJECT
"We had an occasion to compare the Rammer along with two other machines and it was surprising how much more material the Barco Rammer would handle."—*Westway Excavating Co., West Los Angeles, Calif.*

MIDWEST WATER LINE
"The Barco Portable Gasoline Rammer has fulfilled our expectations 100%. It is now in use on a 32,000 foot Water Line Project and is doing a magnificent job in keeping up with our backfilling requirements."—*Jones Contracting Co., Detroit, Mich.*

HOUSING PROJECTS
"Soil compaction with the Barco Rammer has been the key to earlier completions and lower costs for us."—*Paul Schleicher & Sons, Gary, Ind.*

OHIO TURNPIKE
"Exceptional time and labor is saved in the speed of the Barco Rammer with comparison to our previous method . . . We found it difficult to meet the rigid specifications required by the Ohio Turnpike Commission until we instituted the Barco Rammer, and can recommend it very highly to any organization having to meet specifications."—*Angell Construction Co., East Lansing, Mich.*



This photograph shows a Barco Rammer working on the Trenton Freeway in New Jersey.

WHEN YOU'RE UP AGAINST A TIGHT SCHEDULE—

ONE of the most important advantages users get with Barco Rammers for *soil compaction* is ability to handle big jobs in minimum time. When time is at a premium, BARCO PERFORMANCE PAYS DIVIDENDS!

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If you are not already using the Barco Rammer for soil compaction work, find out about it now! *Worldwide Sales and Service.* BARCO MANUFACTURING COMPANY, 518M Hough St., Barrington, Ill.

BARCO RAMMER

For Soil Compaction Close to Walls, Culverts, and Abutments—in Trenches, Ditches

property and realize a profit.

A cabin cruiser and an expensive convertible are included in the next item, All Other Assets. As with real estate, disposing of these items for cash would be a lengthy process and would probably result in a loss. As a rule, contractors refrain from buying personal luxury items, plowing a healthy amount of their earnings back into the business so they will be prepared to bid and handle larger and larger contracts.

The item of Pre-paid Insurance cannot be considered a current asset. This item appears in practically all contractors' financial statements. The insurance is a protective element, necessary for the safe conduct of the business. If any attempt were made to cancel this insurance in order to obtain a return premium for working capital, it would indicate that the contractor was flirting with bankruptcy.

The smart contractor passes up the personal luxury items and puts his earnings back into the business.

Liabilities

On the Liability side of the statement, the $8,000 loan made to the contractor by the bank was not on an unsecured basis. The bank insisted on the pledging of accounts receivable as security. When a bank has sufficient confidence to make a loan on an unsecured basis, the surety company has a greater feeling of faith in the contractor.

Owing Sub-Contractors, $7,000, is a clear-cut admitted liability. The same holds true for the $18,000 under Accounts Payable. In this case, $4,000 of the item is admitted to be past due. If the reason is that the contractor is short of funds, it may mean his finances have been mismanaged or that he is performing work on an unprofitable basis. On the other hand, this item may be explained away because the contractor was furnished with material contrary to specifications, because the material was not delivered on time, or because he is being overcharged.

The statement lists Accounts Owed Subcontractors and Accounts Payable as very high compared with various items of Accounts Receivable. Generally, accounts payable to subcontractors and for materials should not be greater than one-third of accounts receivable. If accounts payable and accounts receivable are about equal, the contractor should be ready to explain the situation.

There is $5,000 in Debts Due from Officers or Employees. In this case, the president lent his corporation $5,000 for working capital and he, as an individual, has taken a demand note in that amount from the corporation. He is able to take $5,000 out of the corporation, perhaps at a time when the money may be needed for working capital. If the officer executes a subordination agreement, in which he agrees not to collect the money without the consent of the surety company, this item can be eliminated as a current liability and the company's working capital increased by $5,000.

Mortgages

Chattel Mortgages or Liens on Equipment amount to $4,000. Any amount due within 12 months of the date of the statement is considered a liability. But if a contractor has a number of jobs running, depreciation is added as part of the job cost when the contractor figures his bid price. Mortgages on Real Estate, $20,000, is not a current liability, since the lender is secured by the real estate itself.

No entry has been made against Bonded Indebtedness. This item is seldom seen, except in a large contractor's statement. All Other Liabilities is an item which is always investigated, if it is of any size, to determine whether they are of a current or long-term nature.

Total Reserves amount to $2,000. Of the several reserves, including interest, insurance, taxes, and depreciation, each may be considered current, except for depreciation. In this instance, John Doe Construction Co. Inc., is on a calendar-year basis. After more than 11 months of operation, the company has not set up any reserve for taxes. It must pay taxes if it has been operating at a

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Sinclair HEAVY DUTY BEARING GREASE is a greatly improved lubricant for bearings in power shovels, drag lines, tipples, conveyors and similar heavy duty equipment. It cuts wear by resisting shock, heavy loads, heat and pounding. It stays put – successfully lubricates large, loose-fitting bearings.

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SINCLAIR LUBRICANTS

profit; if no reserve is set up, the government will attack bank accounts and other assets. The $10,000 in Capital Stock is not a current asset.

The last item, Surplus and Undivided Profits, is listed at $68,000. This could also be called net worth. But it does not tell as much as Current Assets or Working Capital. Current assets can be low and the fixed assets high, resulting in net worth when there is little or no working capital.

After analyzing the financial statement of the John Doe Construction Co., Inc., $35,000 in current liabilities is subtracted from current assets, $44,500. The net current asset or working capital amounts to $9,500. And when taxes due for the past year are subtracted, this item shrinks further.

Financial statements much worse than this one are brought daily to surety companies. Some, not containing sufficient information, must be turned down if they are submitted at the eleventh hour. But a carefully prepared financial statement—one not loaded with questionable items — can vastly improve your chances of securing a bond.

THE END

Line Attachment Gives Close Bucket Control

■ Accurate bucket control over a 25-foot digging range without moving the boom is possible with a Tag-Master tagline winder, according to literature available on request. The manufacturer of the Tag-Master is the Morin Mfg. Co., 946 Elm St., West Springfield, Mass. The largest model available will maintain a uniform tagline control from truck level, to 135 feet below ground level. Other models have a 70-foot range.

In addition to providing constant tagline control, the Tag-Master offers manual control for casting, twisting, or snubbing a clamshell, grapple, or magnet from the cab. The device also converts to a dipper-trip, through a simple adjustment, for use with shovels.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 564.

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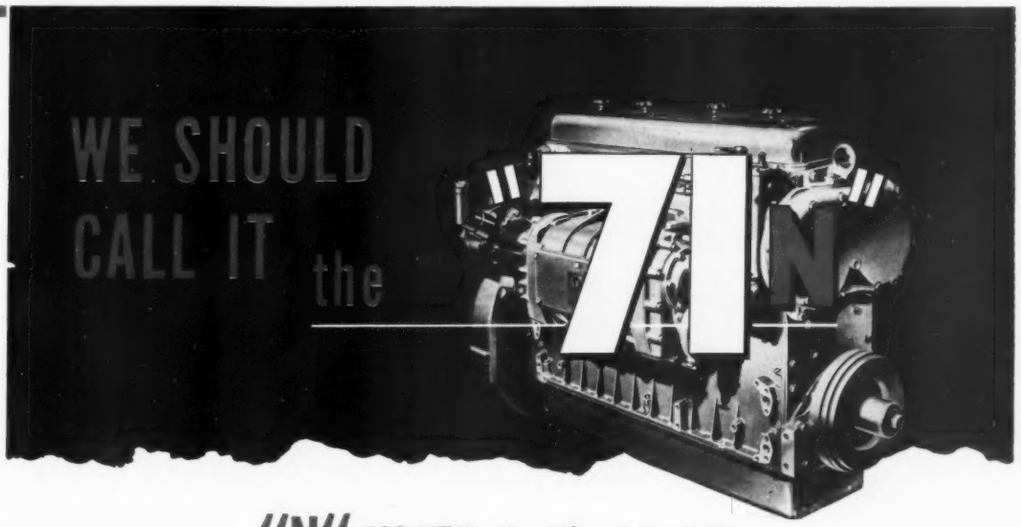

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■ A folder on decals for equipment marking is available from the Miracle Decal Co., 734 S. Washington, Wichita 9, Kans. The literature emphasizes that Miracle decals are made entirely of paint and come in a variety of colors that retain their brilliance and luster in all climatic conditions. Because they can be used at any time, they may be ordered in quantities.

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To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 656.

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He's spending less for cable replacement in his Osgood dragline because the TORQMATIC Converter protects cable by absorbing sudden shock loads.

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You can produce more for less with shock-free TORQMATIC power transmission in your 40- to 400-horsepower gasoline or Diesel equipment. Ask your manufacturer or dealer about TORQMATIC DRIVES in your equipment or write for more information to: Allison Division of General Motors Box 894C, Indianapolis 6, Indiana

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Driving on Roads Under Construction

THE PROBLEM: *A motorist drove upon a road he knew to be under construction. A car ahead, which was turning in the road, temporarily obscured a barrier. In attempting to stop, the first motorist overturned his car where a detour commenced. Did he have a valid damage claim against the road contractor for resulting injuries?*

THE ANSWER: No. (Chesson v. Nello L. Teer Co., 72 S. E. 2d 407, decided by the North Carolina Supreme Court.)

The court reasoned that the motorist could not charge the contractor with failure to provide warning against the barricade. Since he knew that the road was under construction, the fact that there was a car ahead increased the obligation of the motorist to use care for his own safety.

The court cited numerous court decisions to the effect that "one who operates an automobile on a public highway under construction or repair cannot assume that there are no obstructions or defects ahead". He is bound to keep his car under such control that it can be stopped within the distance at which a proper barrier ahead can be seen.

Effect of Dissolution Of Sanitary District

THE PROBLEM: *After a sanitary district had let a sewer contract, it became merged into a city. Did the merger impair the rights of the contractor?*

THE ANSWER: No. (Dickson v. City of Carlsbad, 260 Pac. 2d 226, decided by the Califronia District Court of Appeals, Fourth District.)

The court solved the tangle by dissolving the district and requiring the city to carry out the obligations that had been undertaken by the district in regard to assessment of property benefited and so forth, although the city could not issue its bonds to pay for the work.

Crane-Highline Electrocution

THE PROBLEM: *A sewer-construction worker was guiding a pipe attached to the steel cable of a crane in a street. He was electrocuted when the boom came in contact with uninsulated high-tension wires on defendant's electric line 50 feet above the street. (1) Did these bare facts show that the electric company was liable? (2) If not, would the company be liable on proof that it was aware of the danger because of other similar contacts with its wires and had taken no steps to guard against such accidents?*

THE ANSWERS: (1) No. (2) Yes. (Rott v. Blackstone Valley Gas & Electric Co., 106 Atl. 2d 251, decided by the Rhode Island Supreme Court.)

The court cited a decision by the New York Court of Appeals in a similar case where another electric company was declared to be liable for electrocution of an employee while assisting in removing sheathing from a sewer trench. In that case, a 40-ft. boom came in contact with a wire 34-ft above the ground, and the electric company knew that a crane was operating near its wires. (Bennett v. New York & Queens Electric Light & Power Co., 294 N. Y. 334, 62 N. E. 2d 219.)

The decisions in the two cases above cited are to be compared with one rendered June 23, 1954, by the California District Court of Appeals,

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Fourth District, in the case of Austin v. Riverside Portland Cement Co., 271 Pac. 2d 943. There, two employees of a construction company, at work on the cement company's premises, were injured by electric shock when portable crane-lifting equipment contacted a high-power uninsulated wire that served the premises. The cement company was exonerated from liability because the construction company and its employees were as much aware of the danger caused by the wires, which were 43.8 ft. above ground, as was the cement company and because that company had no reason to believe that the contractor or its employees would violate a California state statute making it a misdemeanor to operate equipment within 6 feet of a high voltage wire. In fact, there was a notice on the crane forbidding its operation within that distance.

Was Not Employee

THE PROBLEM: *A town engaged a firm of excavators to use its bulldozer in dozing out trees along a roadside. While loading the bulldozer upon a town truck for transfer to the job site, a member of the firm was killed. Was his widow entitled to a workmen's compensation award on a theory that he was injured while acting as an employee of the town?*

THE ANSWER: No. (Phaneuf v. Industrial Commission, 1953, 57 N. W. 2d 406. Wisconsin Supreme Court.)

The court reasoned that the status of the firm was that of independent contractors, who were not subject to control by the town officials as to details in doing the work. This was so although the firm was to be paid at an hourly rate and was permitted to use the town truck in moving the bulldozer.

Pedestrian Killed on Bridge Construction

THE PROBLEM: *A pedestrian on a by-pass bridge was warned by a watchman one night not to go onto an adjacent uncompleted bridge at a point where a flight of steps connected the two structures. The pedestrian—apparently intoxicated—persisted and fell into an excavation. Was the bridge contractor liable for his resulting death?*

THE ANSWER: No. (Durbin's Administrator v. Nally, Ballard & Saltsman, 263 S. W. 2d 102, decided by the Kentucky Court of Appeals.)

The court reasoned: The contractor, having placed suitable warnings at street entrances to the work, was not negligent in failing to post them at the steps near where the accident occurred. Furthermore, the watchman had specifically warned the pedestrian. The legal obligation of a contractor to post warnings "was never intended to relieve a person of the duty of exercising ordinary care for his own safety". Even if venturesome persons had previously used the uncompleted bridge as a walkway, to the knowledge of the contractor, that would not create liability to one injured by walking into obvious danger.

Power Shovel Vs. Mink

THE PROBLEM: *A mink rancher in Wisconsin complained to a contractor that the noise of a power shovel being operated on an adjacent highway was annoying his mink and asked that a muffler be installed. There was a delay in installing the muffler, although the contractor had been notified that the noise endangered the mink and their young. During the delay, the noise so disturbed the mink that some of them destroyed their young and themselves. Was the contractor liable for the resulting loss?*

THE ANSWER: Yes. (Bell v. Gray-Robinson Construction Co., 62 N. W. 2d 390, decided by the Wisconsin Supreme Court.)

The court reasoned that the contractor was liable, not for using a power shovel at the time and place, but for using it without a muffler after being notified that failure to use one would be apt to result in loss for the rancher.

Equipment Rental

THE PROBLEM: *Heavy construction equipment was leased under option of the lessee to buy it. Monthly rental*

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Four 80,000 c.p. flood lights raise to 8½ ft.—aim in all directions. Control panel has duplex receptacles for extension light and power tool lines — voltage regulator — circuit breaker — fused circuits.
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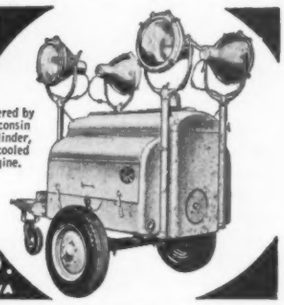
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payments were due at the end of each month. Without demand for payment, the lessee sent the lessor a check to cover the purchase price and rental to that point. By mistake, the lessee's bank dishonored the check as being drawn against insufficient funds. The lessor then ordered the lessee to return the equipment, and insisted upon it after being notified that a mistake had been made by the bank and that the check would be honored if sent through again. Did the lessee become owner of the equipment?

THE ANSWER: Yes. (Holland v. Anderson Bros. Corp., 207 Fed. 2d 839, decided by the United States Court of Appeals, 2d Circuit.)

The court reasoned that since no demand had been made upon the lessee for payment the lease agreement remained in force, and that a forfeiture of the contract should not be permitted in view of the fact that the lessee had in good faith attempted to pay what he owed and to have the bank's mistake remedied as soon as possible.

Road Inspector Hurt—Contractor at Fault

THE PROBLEM: *A state highway construction inspector was seriously injured, while in a kneeling position checking the alignment of a concrete form, when a truck backed up and ran over him. Could the contractor be held liable on a theory of negligence in the manner that equipment was located on the job and of failure to supervise properly the backing of trucks in an area where congested operations and frequent truck backing were carried on?*

THE ANSWER: Yes. (Crawford v. Woodrich Construction Co., 57 N. W. 2d 648. Minnesota Supreme Court.)

The court said that, in using instrumentalities under its control, it was the company's duty to exercise reasonable care for the inspector's safety. The contractor should especially have forseen that, in making alignment inspections, the inspector would normally take a position where he could not see backing trucks.

Incidentally, it was decided that, under Minnesota law, the fact that the inspector received a workmen's compensation award from the state did not preclude a damage suit against the contractor. A jury awarded $80,000 damages.

Sales Tax Exemptions

THE PROBLEM: *The Ohio sales tax law provides that if a consumer refuses to pay a tax or refuses to sign and present to the seller a proper certificate showing that the sale is not subject to tax, he shall be personally liable for the tax. If a road contractor did not furnish exemption certificates at the time each purchase was made but did furnish them at the end of each month in settling for purchases, did he thereby render himself liable for taxes?*

THE ANSWER: No. (Shafer v. Peck, 117 N. E. 2d 338, decided by the Ohio Supreme Court.)

The court reasoned that delay in furnishing the certificates could not be regarded as a refusal to furnish them.

Concrete-Mixing Plants

THE PROBLEM: *Where a suburban area was zoned as a general commercial district and excluded heavy industries, was a concrete mixing plant barred, although part of the mixing occurred as trucks were in transit to construction sites?*

THE ANSWER: Yes. (Markey v. Danville Warehouse & Lumber Co., 259 Pac. 2d 19, decided by the California District Court of Appeals, First District.)

The court decided that a zoning ordinance was applicable although before its enactment a tract had been used for small-scale storage of sand and gravel. This decision was made even though the local building inspector had issued a permit after an official attorney had issued an opinion that the mixing plant could be established under the ordinance, and a planning commission had given its approval.

It was also decided that the plant could be regarded as a private and public nuisance at the particular location without proof that unnecessary and annoying methods of operation were used. It was enough that nearby residents were frequently disturbed by loud noises of motors, trucks, hammering, and night operations.

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Servicised Resin Base Curing Compound is recommended for curing exposed concrete such as pavement slabs, bridges, abutments, walls, etc. Sprayed or painted, it forms a uniform membrane capable of holding moisture in the concrete to assure proper curing.

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6051 West 65th Street, Chicago, Illinois

The Electronic Witch pipe finder in operation.

Electronic Pipe Finder Features New Circuit

■ An improved electronic pipe and cable finder has been marketed by Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif. The latest development in the Fisher M-Scope line of electronic detectors, the Electronic Witch, features a new electronic circuit housed in durable Fiberglas cabinets.

The conventional hand-wound multi-turn antenna loops have been eliminated, and the new circuit does not employ a beat oscillator to obtain the headphone and meter signal. The result is improved stability and uniformity of performance. A sensitive 97 to 105-db-gain fluid-leak detector has also been incorporated in the device, so that it may be used as a pipe-leak detector.

The Electronic Witch is reported to locate the position of buried pipes, cables, and other metal objects at a greater depth and with more exactness than possible before. It determines depth by a new instrument-type depth level.

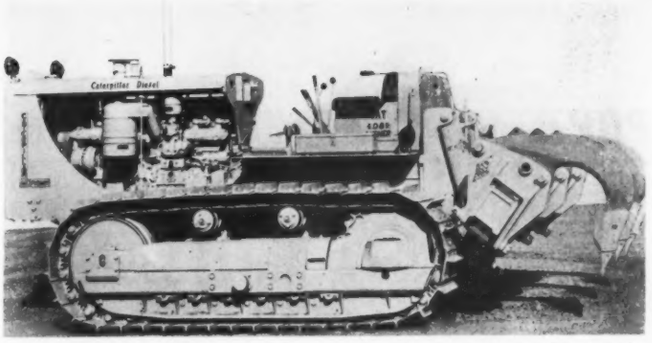
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 562.

Form-Oil Concentrate Makes Stripping Easy

■ A folder describing a form-oil concentrate is offered by the Servicised Products Corp., 6051 W. 65th St., Chicago 38, Ill. Servicised form-oil concentrate, diluted one part to 12 parts of water, is used in concrete forming to prevent stripping blemishes, to speed stripping, and to enable forms to be stripped cleanly for immediate re-use.

Because it is applied by spraying, brushing, or dipping, and has a wide range of dilution ratios, the concentrate has the flexibility needed for coating various types of forms and molds in precast concrete production.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 655.



THE ATECO ROCK RIPPER is now being manufactured by the Greenville Steel Car Co., Greenville, Pa., under license from the American Tractor Equipment Corp. Greenville is distributing the device east of the Mississippi River. The rock ripper, made for use with the Caterpillar D-8 tractor, is designed for fast demolishing of all kinds of road surfaces in road-repair or rebuilding projects. Hydraulic-powered, the ripper has replaceable rock points with splitting wedges. Underground "quiver" of curved standards helps shatter rock and shale. For further information write to the company, or use the Request Card at page 18. Circle No. 580.

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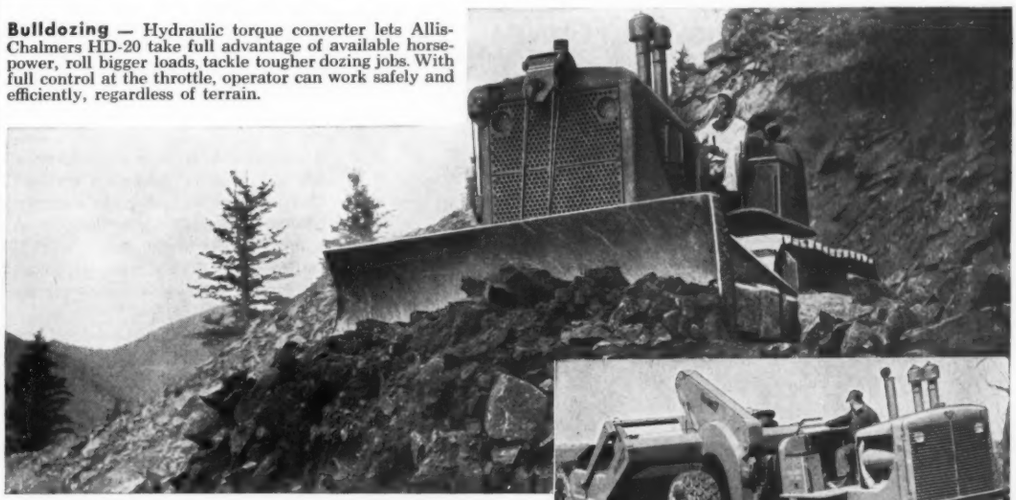

Bulldozing — Hydraulic torque converter lets Allis-Chalmers HD-20 take full advantage of available horsepower, roll bigger loads, tackle tougher dozing jobs. With full control at the throttle, operator can work safely and efficiently, regardless of terrain.

Pulling — Hydraulic torque converter drive actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly . . . and automatically accelerates to the highest speed that conditions permit, in either high or low range.

AN ALLIS-CHALMERS REPORT

How hydraulic torque converter drive improves big tractor performance—increases job output

Allis-Chalmers offers the only crawler tractors that are capable of exerting maximum drawbar pull *at all times* . . . under all load and terrain conditions . . . without gear-shift guesswork.

Whatever the job, the operator need merely make contact with the load and then open the throttle. As the load requirements change, the hydraulic torque converter *automatically* matches the conditions with exactly the right combination of speed and pull.

This eliminates most shifting . . . leads to far more work done in a continuous work cycle . . . far longer equipment life.

• • •

Hydraulic torque converter drive is just one of many reasons why the Allis-Chalmers HD-20 and HD-15 assure you higher output, less upkeep.

HD-20 — WEIGHT — 41,000 LB • 175 NET HP AT FLYWHEEL
HD-15 — WEIGHT — 28,000 LB • 135 NET HP AT FLYWHEEL

Pushing — Operator just makes contact, then opens the throttle and relaxes. The HD-20 automatically matches speed to that of pushed equipment, maintains steady contact while loading, sends load off to the fill at higher speed.

Digging and Loading — With the HD-20G, the operator crowds surely and steadily, using only throttle and bucket levers. With full horsepower always available even at creeping speed, he can work effectively in mud, on hillsides or edges of banks.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

PORTRAIT IN PRINT

Going Broke—A Step to Success

By RALPH MONSON

Between time spent working as a national director of AGC and secretary-treasurer of Forcum James Co., Inc., Dyersburg, Tenn., C. B. Ford relaxes at home.

FOR HIS FIRST job in engineering, Clarence Beech Ford was handed a transit by his employer, assigned a crew, and sent out to stake a drainage ditch. Ford was only 22 that summer of 1917. He had just completed his pre-med course at the University of Arkansas, and had chosen a job with a civil engineer over a job in a bank or work as a teacher. He had never tried to make a survey before, but he set up the transit at a fence corner in the field and proceeded to set off the magnetic bearing for the first leg of the survey, as he had been instructed.

Though he didn't know that the fence was deflecting the needle, Ford realized immediately that something was wrong. He knew his line wasn't pointing in the right direction. He knew also just where the other end of the ditch was supposed to be. So he took transit and crew to the other end of the proposed ditch and ran the line in backwards.

Today, secretary-treasurer of Forcum James Co., Inc., Dyersburg, Tenn., a national director of AGC, and one of the well-known figures in the construction industry, particularly in the south and middle west, Ford dates his start in contracting from that summer.

Until that time, his education at a boarding school and then at the University of Arkansas had been preparing him for a medical career. The son of a country doctor, Ford was raised in rural Arkansas, where his earliest recollections include the two-mile walk to and from grade school. Once he had decided to go into contracting, he let nothing stand in his way.

"Worse Than Broke"

Ford returned to the University of Arkansas for one term of engineering before serving a hitch in the army in World War I. Out of service, he went into partnership with a small paving contractor, and together they subcontracted sections of some of the early concrete pavements in Arkansas. According to Ford himself, the firm was "worse than broke" in a couple of years. Equipment prices dropped, jobs were hard to get, and the creditors were ready to take over.

At about that time, the partners took a job in Dyer County, Tenn., under the Forcum James Co., and

JOB AFTER JOB, FRANKI FOUNDATIONS
SAVE TIME, TROUBLE and MONEY!

When the U. S. Corps of Engineers planned a huge, double-cantilever hangar for Westover Field Air Force Base at Chicopee Falls, Massachusetts, foundation designs called for spread footings. The contractor, F. D. Rich Company, used Franki Displacement Caissons as an alternate design, and eliminated 900 cubic yards of heavily reinforced concrete. Result: *F. D. Rich Co., saved material and—the Air Force saved* $30,000!

Here again, Franki Foundation Co., demonstrated the ability to *save time, trouble* and *money* for both client and contractor. For the many advantages of the Franki Method, write to Franki Foundation Co., 114 East 40th Street, New York, N. Y., for brochure describing Franki Methods and "Franki Facts" on this job.

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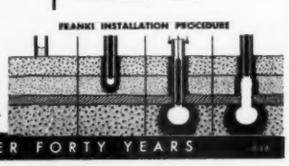

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- Line is graduated to 8ths, with feet and inches marked every inch.
- Rugged maroon vinyl case has welded metal liner.
- Rewind handle folds flat, opens easily with push pin.
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SAGINAW, MICHIGAN
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Barrie, Ontario

C. B. Ford gives up medicine for construction and finds the rewards outweigh the hardships

The Fords in their Dyersburg home. Although Mrs. Ford stopped teaching music at the time of their marriage, she still likes to play the organ for her own and the family's entertainment.

Ford came under the influence of Hilt Forcum, then president of the company. Forcum James was then building bridges and doing concrete paving. Forcum took Ford under his wing with the admonition: "The best thing that could have happened to you was to go broke. Now it's time to go to work."

Forcum stood in the breach between Ford and his creditors. Ford took over and managed small jobs for Forcum James Co. on a profit-sharing basis. Then in 1928, with his accrued earnings, he bought stock in the company and became its secretary-treasurer.

Forcum James Co. has since expanded until they now have several divisions doing practically all phases of construction work. The highway division does grading, both concrete and bituminous paving, and also builds bridges. Two building divisions handle everything from residences to large schools and industrial buildings. A levee division has built many of the levees in the lower Mississippi basin. In addition, the firm operates three retail lumber yards. The corporation today is headed by

(Concluded on next page)

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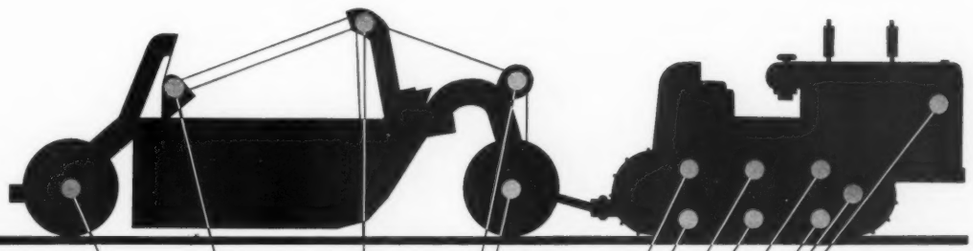
now 1 grease replaces 7



NEW STANDARD LITHIUM MULTI-PURPOSE GREASE

● Here is a true multi-purpose grease that can be *used practically anywhere* on the job or in the shop. With new STANDARD Lithium Multi-Purpose Grease you can effectively lubricate all normally encountered grease-lubricated bearings with just one grease! No need for keeping old-fashioned special-grease inventories with complex dispensing equipment . . . no chance of costly application mistakes.

New STANDARD Lithium Multi-Purpose Grease is water and high-temperature resistant and can be used in mechanically and hand-operated dispensers and in grease cups. It replaces such greases as viscous lubricants, water pump grease, wheel-bearing grease, cup and fiber greases and can be used for general chassis and lubrication of a wide variety of bearings—ball, roller, plain, needle—under wet and hot operating conditions. Meets rigid requirements of wheel bearing manufacturers.

Now you can reduce grease inventories, eliminate waste, do away with costly application errors with STANDARD Lithium Multi-Purpose Grease. Ideal for fleet operators, contractors, other large-scale users of heavy automotive equipment. Call your nearby Standard Oil lubrication specialist now.

STANDARD

STANDARD OIL COMPANY *(Indiana)*

(Continued from preceding page)

V. Forcum, and R. M. Ford, a brother of C. B., is vice-president.

Built Army Bases

One of the largest projects handled by Forcum James before World War II was the $6 million Arka Butla Dam in Mississippi. During the war, the firm was associated with a number of other contractors in the joint-venture construction of more than $100 million worth of airports and bases in the mid-south area. When the big Garrison Dam on the Missouri River in North Dakota was started, Forcum James, together with H. N. Rogers & Sons Co., and S. K. Jones Construction Co., both of Memphis, Tenn., were the successful bidders for the first stage embankment. Excavating with draglines and shovels and hauling with Euclids, the firms moved more than 16,000,000 cubic yards of earth and completed the many other items in the first-stage earthwork contract. However, they were not the successful bidder on the second stage and did not bid succeeding stages.

Ford recalls that the levee division used to haul dirt with mules and wheel scrapers. These were later replaced with tractors and wagons, and now have been superseded by rubber-tire haul rigs. Much of the levee building has been done by the big Page walking draglines having booms up to 135 feet in length, and 6 to 8-yard dragline buckets. These machines commonly cast the material twice to get it from the borrow pits to the finished levee section. On the levees from Cairo to New Orleans along the Mississippi, it was not uncommon to move as much as 1,000,000 cubic yards of earth per month, with the big draglines each averaging 150,000 cubic yards.

Although the big levee-building era appears to be about over, the company still does some of this work each year. Competition was especially keen this year. On one particular job involving 370,000 cubic yards there were ten bidders, and Forcum James was low with a bid of $0.2169 per yard. The next bid was $0.2187, just $0.0018 higher.

Floating Asphalt Plant

The company's asphalt division, headed by G. J. Sander, has set up a special equipment spread for placing asphaltic surfacing on river bank slopes in connection with revetment projects. The central piece of equipment is a 210-foot barge which carries a Barber-Greene asphalt plant with a capacity of 150 tons per hour. A crane on the barge charges the bins of the plant with aggregate, which is delivered in separate barges. Asphalt cement, brought in by barge directly from refineries along the river, is stored in the hull of the plant barge. The hull is equipped with steam coils heated by a large boiler.

Aggregate for the mix is loaded by dozers and cranes from sand bars along the river. A floating crane with 125-foot boom picks the material from the asphalt plant with a 1½-yard clamshell bucket and swings it to a spreader box on the bank. A tractor on the top of the bank pulls the spreader box up the bank, leaving a uniform 5-inch mat of the sand-asphalt mix. No compaction is applied to the mat. This same floating plant has been used for bituminous mixtures for highway work in Arkansas.

Unlike Ford, who didn't follow in his father's footsteps to become a doctor, his two sons, Kent and Jere, both work for Forcum James. Mrs. Ford is the former Gladys Blankenship. Although she gave up teaching music when they were married, she still retains her interest in music and likes to play the Hammond electric organ in their Dyersburg home.

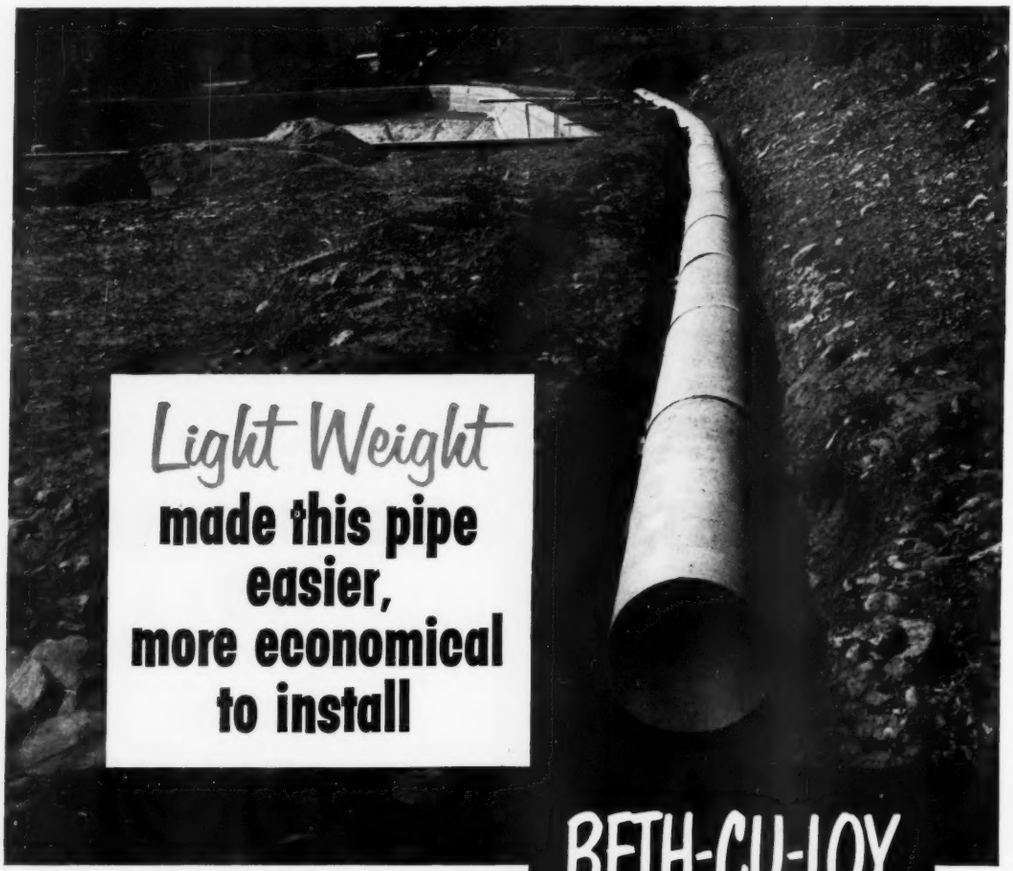
Though active in the Dyersburg Country Club, the local American Legion post, the Shrine, and in the AGC as a national director and member of the advisory board this year, Ford enjoys playing cards and entertaining at home.

Looking back on his own experience, Ford feels that young men should make up their minds about what they want to do, and then try to do it. Too many young people, he thinks, have difficulty getting located because they do not have a clear-cut goal. He recommends the construction business to young men who are interested in the industry, but he speaks from personal experience when he says the road is not an easy one to follow. THE END

Catalog On Hand Torches

Its complete line of torches and tips for oxyacetylene cutting and welding is illustrated in a new booklet from the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 537.



No costly lifting equipment was needed on this drainage project. Just a trench hoe and a few men. This is corrugated galvanized steel pipe, so light that it can readily be manhandled into position, even in large diameters.

Yet despite its light weight, corrugated steel pipe is strong, tough and flexible. It can "take" the crushing loads, impact and vibration of modern traffic. It conforms well to grade and alignment, absorbs changes in load caused by freezing and shifting soil.

Where trenching is required, the trench need be only wide enough to admit the pipe. With galvanized steel, there's less earth to remove, less to replace, than with any other type of drainage material. No breakage to allow for, either.

Bethlehem does not make the pipe itself, but does manufacture the corrugated and plain galvanized stock used by those who fabricate it. Known as Beth-Cu-Loy, this stock is open-hearth steel, with copper added for corrosion-resistance. Additional protection against rust comes from a tight, 2-oz coating of Prime Western zinc.

Beth-Cu-Loy galvanized culvert sheets conform to the rigid specifications of AASHO. You can get additional details about this culvert sheet steel through any of our sales offices, as well as the names of fabricators who use it.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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Miller SWIVELS for Blocks

As adapted to blocks, MILLER Ball Bearing Swivels prevent loads from spinning and fouling the lines. Miller Swivels turn freely under heaviest loading (capacities to 250 tons). Small Miller Swivel on dead end simplifies restringing —no line twist or kinking.

Let us work with you to adapt Miller Swivels to your particular needs.

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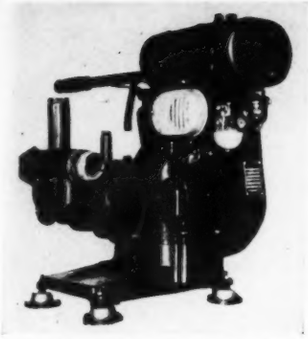

The Model K Porto pressure pump.

Portable Pressure Pump Designed For Field Use

■ A pressure pump designed for construction use is offered by Porto Pump, Inc., 277 Iron St., Detroit 7, Mich. The pump delivers about 50 gpm at free flow and 26 gpm at 200 psi. Two models available weigh 89½ and 95 pounds, respectively, and are equipped with a broad base for field use.

The pump, of rubber-gear construction, is now offered with either the Wisconsin AKN engine or the Kohler K 160 engine. It is directly mounted to the engine, and power is transmitted through a self-aligning flexible coupling that absorbs shock.

Typical construction uses listed by the manufacturer include jetting operations, core and exploratory drilling, pressure-testing water mains, and cleaning equipment.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 582.

Line of Magnetic Sweepers

■ Magnetic sweepers used to remove tramp iron and other magnetic materials from roadways, airports, and construction jobs are illustrated in a folder from Homer Mfg. Co., Inc., Dept. 255, Lima, Ohio. Used to keep roads, airports, and construction jobs clean, Homer magnetic sweepers save tires, tire repairs, and downtime, and increase personnel safety.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 556.

Rotary Troweler Features Retractable Riding Wheel

■ A powered rotary trowel featuring a retractable transport wheel is covered in a folder from the White Mfg. Co., 1227 W. Beardsley Ave., Elkhart 9, Ind. The machine described is the recently announced Model T-1 concrete troweler which uses three 14-inch floats or trowels interchangeably in a 36-inch ring diameter. The pitch of the blades adjusts by a control near the handle as the machine runs.

Other features detailed in the folder include a safety throttle control that stops blade rotation if the operator lets go of the machine, and quick blade changing. A stand raises the troweler for changing blades.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 631.

"Everyone around here has a good word for him—I'd rather not repeat it, though."

MULTI-PURPOSE LOADERS SAVE MONEY

Examples of many uses for Eimco 105 Tractors with excavating attachments are sent in by Eimco's field engineers. The customer buys his Eimco for loading but usually finds that it also performs many additional jobs that make the 105 pay for itself quickly in bonus work.

The picture above shows an Eimco high discharge excavator attachment on an Eimco 105 Tractor loading into an ore bin. The owner decided he could save time by cutting a new road into his pit and found the 105 could cut its own road.

Many other Eimco 105 owners are finding them ideal for ripping up old curbs and paving, tearing out old foundations, digging ditches, basements, patching highways and many other jobs in the heat of the desert or the cold of the Yukon — Eimcos are tops on any job anywhere.

Write for more information.

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Eimco 105 with bulldozer attachment

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B-84

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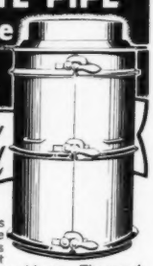
THE "Quinn" Standard



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

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Quinn WIRE & IRON WORKS BOONE, IOWA

Asphalt Mix Resurfaces Worn Concrete Highway

This stretch of the Pennsylvania Turnpike near Somerset has been resurfaced with a 2-inch binder course and a 1-inch bituminous wearing course.

A 22-MILE STRETCH of cement-concrete pavement on the Pennsylvania Turnpike was covered with a 2-inch binder course and a 1-inch wearing course of asphaltic concrete this fall in a speedy resurfacing job which saw no interruption of traffic on the heavily traveled route. Two paving finishers were used while traffic was diverted around the work to the opposite dual lane.

The Pennsylvania Turnpike Commission awarded a contract for the job, near Somerset, Pa., to the Latrobe Construction Co., Latrobe, Pa., at a bid price of $1,045,106.20. The contract was awarded in mid-July, but delivery of materials to the site, a spell of rainy weather, long hauls of paving material, and other delays combined to hold up the progress of the job. Once paving got under way, however, Latrobe rushed the project to completion before cold weather.

The resurfaced stretch, with Somerset located near its mid-point, extends from the Laurel Hill Tunnel on the west to the Allegheny Tunnel on the east. Part of the original pike built in 1940 without a prepared subgrade, foundation, or improved drainage, the reinforced portland-cement concrete pavement had only recently begun to show signs of surface wear.

Specifications called for an initial leveling course of bituminous mix to bring the surface to level. Then a reinforcing of welded wire fabric to prevent or minimize cracks in the new surface was called for, followed by the binder and wearing courses of asphaltic concrete.

First step in the project involved cleaning of the old concrete pavement and cutting the joint sealing back to level. For the latter operation, Latrobe used a Tennant joint-cleaning machine operated by a Wisconsin 25-hp air-cooled engine. Both longitudinal and transverse joints were cleaned with this machine.

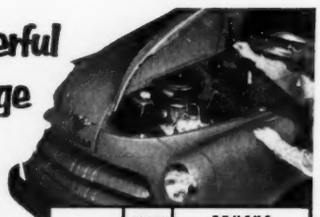
Wire Fabric

Welded wire fabric used on the job was made of No. 10 gage steel wire spaced 3 inches × 6 inches in sheets 11½ × 7 feet and weighing 31 pounds per 100 square feet. Hog rings were used to fasten the sheets where they overlapped.

Original specifications called for use of this welded wire fabric on the entire 22-mile stretch. The first 4½ miles of paving extending west from the Somerset interchange on the

World's best trucks... by actual comparison!

Most powerful low-tonnage truck engine!



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New Power-Dome V-8 delivers sensational 145 hp. . . . more than any other low-tonnage truck engine

	DODGE	TRUCKS F	I	G	C
Max. HP. of leading ½-, ¾-, 1-ton trucks	145-hp.	130-HP.	126-HP.	125-HP.	112-HP.
HP. per cu. in. displacement	.601	.544	.524	.503	.476

Best truck visibility!

Facts prove it

MAKE	DODGE	TRUCK F	TRUCK I	TRUCK G	TRUCK C
Windshield Area	951 sq. in.	938 SQ. IN.	841 SQ. IN.	728 SQ. IN.	728 SQ. IN.
Total Vision Area	2261 sq. in.	2103 SQ. IN.	1705 SQ. IN.	1890 SQ. IN.	1890 SQ. IN.

Sharpest turning trucks!

and here's the proof...

Make of ½-ton Pick-Up	No. of ft. for U-Turn
DODGE	36¾'
TRUCK F	37½'
TRUCK I	38½'
TRUCK G	41'
TRUCK C	39½'

Roomiest truck cab!

Here's proof!

Make of Truck	Hip-room	Shoulder-room	Seat Height
DODGE	61¾"	58⅜"	16"
TRUCK F	60¾"	56¼"	13½"
TRUCK C	60"	55½"	14¼"
TRUCK G	60"	53½"	14¼"
TRUCK I	58¼"	57"	13⅝"

DODGE "Job-Rated" TRUCKS

ASK US TODAY ABOUT A BETTER DEAL FOR THE MAN AT THE WHEEL!

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Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

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The spring and shoe device just ahead of the conveyor screw on the finisher irons out bulges in the wire fabric and prevents it from becoming caught in the machine.

Dump trucks on GMC and International chassis deliver the asphaltic hot-mix to Barber-Green finishers operating over a 24-foot width of divided highway. Plant-mix scattered ahead of the trucks and pavers gives traction on the welded wire fabric.

northern side of the divided highway saw the use of the fabric all along the way, but with time and the threat of cold weather pushing the job, it was decided to use the fabric only at transverse joints. This use of the fabric was made on the next 15½ miles of 24-foot pavement. Ultimately, it was decided that the job would have to be speeded up even more if work were to be finished by the end of the paving season. As a result, the fabric was omitted from the remainder of the work.

In paving, Latrobe used two Barber-Greene finishing machines side by side. Where fabric was used, four 80-pound steel railroad rails were hung from the bottom of the finisher. These slid along the fabric, holding it flat against the pavement and preventing its getting entangled in the finisher. A spring and shoe device just ahead of the finisher's conveyor screw ironed out bulges in the fabric. Plant-mix was put down ahead of the finisher's tracks to increase traction on the upgrades.

The two finishers laid a 2-inch-thick compacted course of asphaltic concrete across the 24-foot width of one

(Concluded on next page)

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USE THE DRILL THAT GIVES YOU 50% MORE HOLES!

● Users tell us they get 50% more holes in concrete with TERMITE Rotary Masonry Drills. This superior performance is due to TERMITE's exclusive worm construction and the "WICTU" inserts which last longer and penetrate faster. TERMITE Drills give you cleaner, more accurate holes and their pulverizing action eliminates objectionable noise. Insist on the loader in the field. Remember the more holes you get per drill — the lower your drilling costs. Write for FREE literature and the name of your nearest TERMITE Drill distributor.

Lengths up to 36". Standard diameters from 3/16" to 5". Other diameters up to 8" on special order. Use with standard electric drills or air motors. FREE FACTORY SERVICING.

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Manufacturers of
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87 N. Lotus Ave., Pasadena 8, Calif.

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Model 543 pneumatic tired Bucket Loader. Easily converted for coal or snow.

Model 82-A crawler mounted Bucket Loader. Hydraulically controlled trimmer-conveyor optional.

LOAD the cheapest way.
LOAD from stock pile, bank, or windrow.
LOAD and screen in one operation.
LOAD and strip topsoil in one operation.
LOAD with the most advanced engineering developments in the loading field.

Let us show you how a Barber-Greene Loader can reduce your costs.

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Barber-Greene
AURORA, ILLINOIS, U.S.A.

WRITE for INFORMATION

descriptive literature . . . sound movies
cost studies . . . nearby job inspection . . . plant layouts

This Tennant joint-cleaning machine is used to cut out longitudinal and transverse joints prior to putting down a binder course on the worn pavement.

(Continued from preceding page)

side of the divided highway. A 3-wheel 10-ton Galion Chief did the initial compacting. Two 2-wheel Buffalo-Springfield rollers followed up with diagonal and cross rolling.

About a day or two after this operation, a 1-inch wearing course was placed by Allegheny Asphalt & Paving Co., Pittsburgh, Pa. Slag sand and slag coarse aggregate were used in this course. Allegheny hauled this material from a batch plant set up just outside of Somerset at the center point of the job. A 2-wheel Galion and 3-wheel Buffalo-Springfield tandem were used to roll this wearing course.

To complete the resurfacing project, turnpike maintenance forces followed the pavers and added a compacted dirt and gravel mixture to the shoulders and median strip to match the level of the new pavement surface. After the center stripe on the roadway was painted, the resurfaced portion was reopened to traffic, thus putting stretches of the job back into use in a matter of days after work had begun.

Binder Course

Hot-mix for the binder course, which conforms to Pennsylvania Highway Department specifications, comprises stone aggregate up to 1½ inches, with a maximum bitumen content of approximately 4.6 per cent. The mix was hauled to the job in 16 to 18-ton truck loads from two Latrobe batch plants at Latrobe, Pa., nearly a 40-mile trip from the extreme eastern end of the job and about 20 miles from the western tip of the stretch.

A total of 633,405 square yards of paving was laid with two 12-foot lanes being paved at a time. Starting at the Somerset interchange, Latrobe paved west on the northern side of the highway to the Laurel Hill Tunnel, then started back east on the southern side of the highway. After reaching the extreme eastern end of the job, the contractor moved over to the northern side of the highway and paved west to the Somerset interchange.

Latrobe Construction Co. was contractor on the job, with Allegheny Asphalt & Paving Co. subcontractor on the wearing course. THE END

A Thanksgiving food package for a Korean orphan will make your own turkey and fixings taste a lot better. CARE, 600 First Ave., New York, N. Y., will handle the gift for you—just send a contribution of $5 or $10.

New Half-Tracks Fit Wheel-Mounted Tractors

■ Half-tracks for Massey-Harris tractors have been introduced by Arps Corp., New Holstein, Wis. The company also makes half-tracks for Allis-Chalmers, Case, International Harvester, John Deere, Oliver, Ford, Ferguson, and Fordson Major tractors.

The Blackhawk half-tracks, by eliminating wheel slippage, assure full use of all tractor power on all jobs, in all soils. They provide superior traction, greater flotation, and more stability for snow removal, grading, bulldozing, ditching, backfilling, leveling, landscaping, working with loaders, and hauling heavy equipment.

For further information write to the company, or use the Request Card at page 18. Circle No. 539.

Wrought-Iron Pipe

■ Technical data based on an analysis of thousands of piping systems in which wrought iron is specified to help solve corrosion problems is contained in a new booklet from the A. M. Byers Co., Clark Bldg., Pittsburgh 22, Pa. Sections of the new publication are devoted to a roundup of wrought-iron pipe installations, a review of piping properties essential to long and economical service life, descriptions of individual service in building piping systems, and recommendations to help reduce the rate and severity of corrosion.

Also included in the bulletin is an 11-page chapter that deals exclusively with water analysis and treatment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 663.

Tamping — Here's a Le Roi-CLEVELAND backfill tamper air-powered by Tractair, that gives you faster, easier tamping, better compaction, lower costs. This example shows how Tractair teams up with Le Roi-CLEVELAND Air Tools to save time, work, money.

Cutting asphalt pavement — with a Tractair-powered Le Roi-CLEVELAND paving breaker. Note, Tractair in background is equipped with a sweeping attachment. This is just another of many ways that Tractair can save you money.

Drilling trench — Easy holding Le Roi-CLEVELAND sinkers provide the fastest way of drilling rock. The air-power source is a Tractair, equipped with a front-end loader. Tractair is extremely mobile. It has a low center of gravity. It takes money-saving air power anywhere.

LE ROI TRACTAIR

...the 10 in 1 machine that does 10 basic jobs to save you money

It holds down your investment in special equipment

Because Tractair is a combination 35-hp wheel tractor and 105-cfm air compressor, it is extremely versatile.

It lets you take air power wherever you want it — air power for drilling rock, tamping fill, breaking concrete, driving spikes and form pins, or pumping water.

When it is equipped with attachments, you get added usefulness. You can load, back-fill, dig, sweep or hoist.

Although Tractair was pioneered and developed by Le Roi Company to do 10 basic jobs, its money-saving usefulness on costly, nuisance-type work is limited only by the user's imagination.

If you want to cut costs, get Tractair. Call your Le Roi dealer for a demonstration, or write us for further information.

LE ROI GIVES YOU MORE FOR YOUR MONEY

More Utility! More Profits!

Lightweight Winch

■ A new lightweight winch has been added to the line manufactured by Tulsa Winch, Division of Vickers, Inc., 815 E. First St., Tulsa, Okla. The Model 5 is 11 inches high and weighs only 80 pounds, yet is reported powerful enough to operate with a safe working load of 6,000 pounds. The winch has a high worm-gear ratio of 60 to 1, which permits direct drive from the source of power and eliminates the need for a worm brake.

For further information write to the company, or use the Request Card at page 18. Circle No. 514.

Concrete-Sawing Machines

■ The Concut line of concrete-sawing equipment is illustrated in a folder from Concrete Sawing Equipment, Inc., 331 N. Santa Anita Ave., Arcadia, Calif. The standard model described can saw concrete and asphalt up to 5 inches in depth with a 14-inch blade. A lightweight model works to depths up to 3 inches.

Self-propelled machines are also shown in the folder, including a unit designed with a steering wheel and seat for the operator.

The Concut line also includes the Jointmaster, a multiblade cutter available in 12 and 25-foot models.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 535.

Device Indicates Slump Of Concrete Mix

■ An indicating and recording device for central-mixing plants that helps to control the slump of concrete is made by the Imperial Construction Equipment Co., 230 W. North Ave., Northlake, Ill. The Tel-A-Slump is available in an indicator model and also as a unit that both indicates and records slump.

The device exploits the fact that in most central mixers the load in the electric motor is inversely proportional to the slump of the concrete. By measuring the power requirements of the drive motor, the Tel-A-Slump derives the slump, expressing it in inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 534.

Booklet Shows Some Uses Of Small Crawler Tractor

■ Some of the jobs a contractor can do with the little crawler-mounted Agricat tractor are illustrated in a new catalog available on request. The Agricat tractor, which is 58 inches long, 38 inches wide, and weighs 1160 pounds, draws power from an 8.25-hp Briggs & Stratton gasoline engine. The manufacturer is Earl H. Pence & Co., Inc., 2150 Washington Ave., San Leandro, Calif.

A 4-cubic-foot bucket, a 45 × 14-inch dozer blade, a rotary boom, a scarifier, and several other attachments indicate that the small tractor can be a versatile machine. The booklet shows it grading and backfilling on a housing project, loading dirt, and cleaning out a storm sewer.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 629.

Sand And Gravel Plants And Dredging Equipment

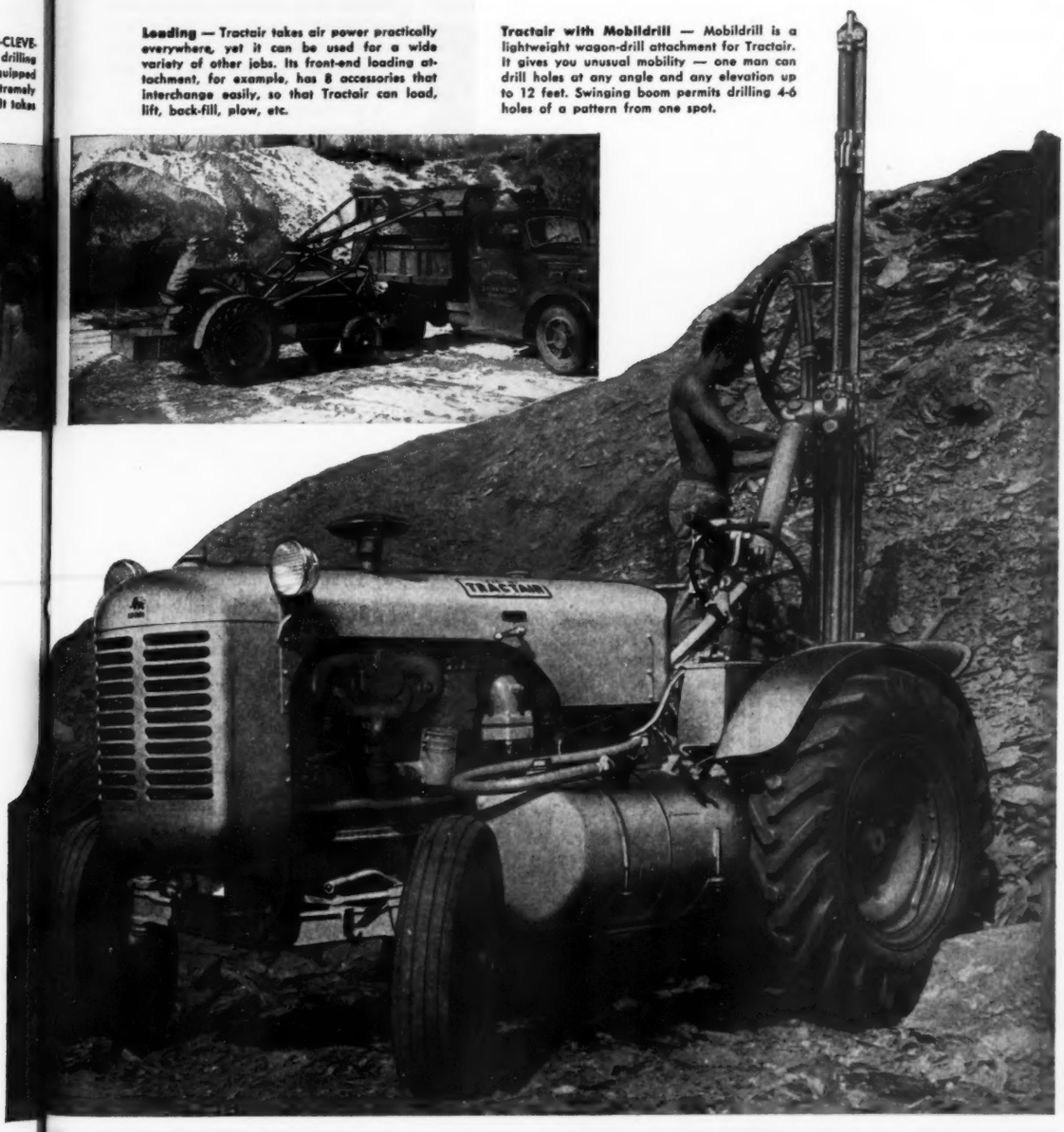
■ A booklet covering Meckum dredging machinery and equipment for sand and gravel plants is available on request. Meckum Engineering, Inc., Dayton Road, Ottawa, Ill., offers complete standard or custom-designed hydraulic dredges, as well as dredge pumps and chain-type cutters.

The company also designs and manufactures sand and gravel plants for all phases of production, from recovery of raw material to the finished product. The booklet illustrates, in addition, material bins, conveyors, and bucket elevators. Ready-mix concrete plants shown are engineered to function as single units.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 528.

Loading — Tractair takes air power practically everywhere, yet it can be used for a wide variety of other jobs. Its front-end loading attachment, for example, has 8 accessories that interchange easily, so that Tractair can load, lift, back-fill, plow, etc.

Tractair with Mobildrill — Mobildrill is a lightweight wagon-drill attachment for Tractair. It gives you unusual mobility — one man can drill holes at any angle and any elevation up to 12 feet. Swinging boom permits drilling 4-6 holes of a pattern from one spot.



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Details on Shovel Crane

■ Details on the recently announced Bay City 1½-yard shovel crane are contained in new literature available on request. The catalog illustrates machinery and parts, showing many of the advanced designs and improvements in this large-capacity, low-weight, convertible excavator.

Of particular interest is the use of self-energizing shoe-type clutches for the swing and hoist. There are two shoes with a fixed anchor to each clutch. Each shoe has a single adjustment and a thick ¾-inch molded lining. The main drum clutches are set by a power-booster shoe through mechanical linkage, resulting in smooth responsive action.

Another feature is the use of a hydraulic coupling, mounted between a two-plate disconnect clutch and the helical-gear power takeoff. The hydraulic coupling cushions shock loads and prevents engine stalling.

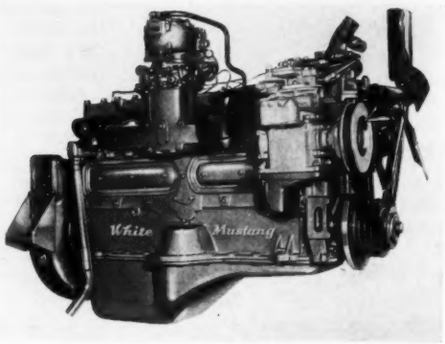
To obtain Catalog 70/700-A write to Bay City Shovels, Inc., Bay City, Mich., or use the Request Card at page 18. Circle No. 576.

Aeroquip Names Hinkley

Aeroquip Corp., Jackson, Mich., has appointed Forrest F. Hinkley general manager of Aero-Coupling Corp., Burbank, Calif., an Aeroquip subsidiary serving the west coast market for aircraft and industrial hose, fittings, and self-sealing couplings.

Joining Aeroquip in 1943, Mr. Hinkley has held the posts of production manager, director of materials, and director of subsidiary operations.

New 200-Hp Engine for Heavy-Duty Trucks



This new 200-hp Model 390A White Mustang engine is now available in the Autocar gasoline-powered truck and tractor lines.

■ A newly designed 200-hp gasoline engine for Autocar trucks has been announced by the Autocar Division, White Motor Co., Exton, Pa. The six-cylinder White Mustang 390A power plant features a new dome-shaped piston for which a companion combustion chamber has also been designed. The combination is reported to permit a compression ratio of 6.4 to 1 with excellent detonation control.

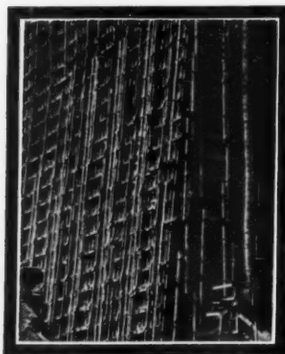
The cylinder block is of chrome-nickel molybdenum-alloy heat-treated cast iron. The cylinders are water jacketed throughout their entire length and circumference for uniform temperature and adequate cooling.

The crankshaft, with its Tocco-hardened bearing surface, is mounted in seven main bearings designed with steel shells, copper-lead lined, and indium treated. There is a torsional vibration dampener at the front end of the crankshaft.

The domed-head aluminum-alloy pistons are cam-ground and fitted with four rings—two compression and two oil. The pistons are constructed with NI-resist top-ring inserts molded into the piston.

In the valve mechanism, the inlet valves are of chrome-nickel molybdenum steel. The exhaust valves are of high chrome-nickel steel with a chrome-plated stem, and are sodium-mercury cooled.

For further information write to the company, or use the Request Card at page 18. Circle No. 579.



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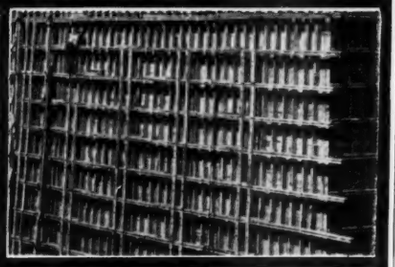
". . . Used on the World's Largest and Fastest Poured Constructions"



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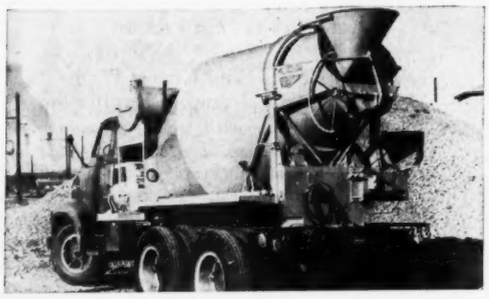
Production Data Indicates Wide Use of Treated Wood

■ Wood-preservation statistics compiled by Gordon D. Merrick of the United States Forest Service show that production of wood that is given preservation or fire-retardant treatment continued heavy during 1953. This data is from the official 1953 report of the Forest Service of the U. S. Dept. of Agriculture, prepared in cooperation with the American Wood-Preservers' Association. The statistics cited represent the output of 288 wood preserving plants, of which 195 were pressure treating plants, 77 non-pressure, and 16 were equipped for both kinds of treatment.

Treated wood produced by these manufacturers is protected against decay, termites, marine borers, and other insects, or is made fire retardant. The total volume of wood treated in 1953 was 292.6 million cubic feet.

To obtain this report write to the American Wood-Preservers' Association, 839 Seventeenth St. N. W., Washington 6, D. C., or use the Request Card at page 18. Circle No. 635.

TRANSCRETE AVAILABLE IN 3 TO 6 YARD CAPACITIES



CMC's Transcrete — the simplest truck mixer of all — features the famous "Thoro-Mix" action that charges, mixes, and discharges all slumps faster.

Large drum diameter, deep "L" section blades and a progressively increasing blade slope are drum design features that make for more thorough mixing, more positive discharge, and a greater ability to handle stiff, low slump mixes.

Transcrete's time saving efficiency means more trips per day as mixer or agitator.

Quality construction and simplified rugged design assure trouble-free life.

Transcrete offers you the choice of a profit making size at the price you want to pay.

CMC OFFERS LARGE VARIETY OF BATCHING EQUIPMENT

CMC's Multiplex Bins fill a long apparent need for a more compact, lower-in-height bin for central plants and many other installations.

They are available in unit construction 16' square — 2, 3 or 4 compartment, 110 or 165 ton, with or without 125 or 175 bbl. center cement compartment, elevator or conveyor.

Interchangeable legs and braces make ground assembly quick, easy. They can be erected in just a fraction of the time usually required.

Batchers are available in 1, 2, 3, 4 or 6 yard sizes with or without cement compartment.

Other Outstanding Batching Equipment

CMC also has Bin Batchers for smaller jobs; cement bins, cement batchers, manual or automatic; automatic water weighers; conveyors and elevators to fit into your present plant.

SOLD & SERVICED BY AMERICA'S BEST DISTRIBUTORS

CONSTRUCTION MACHINERY COMPANIES . . . . . WATERLOO, IOWA

Plaster and Mortar Mixers In Small Portable Models

■ Plaster and mortar mixers in 3½ and 4-cubic-foot sizes are shown in a leaflet from Mar-Rail Co., 560 York Ave., Pawtucket, R. I. Mounted on wheels and measuring 29½ inches wide, these units can work in locations inaccessible to larger mixers.

A convenient feature pointed out is the low discharge height of 11½ inches, which makes it easy to empty the mix directly into mortar boxes. Four adjustable hoe-type blades do the mixing. The machines come complete with a standard positive throw-out clutch, and a large bag cutter. They are offered with either gasoline-engine or electric power.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 561.

Waco Makes Additions To Production Staff

Dean B. Chenoweth and Walter J. Jordan have been named company manager of manufacturing and plant works manager, respectively, for Waco Mfg. Co., Minneapolis, Minn., manufacturer of steel scaffolding and shoring.

The portable Vapor-Clarkson Hydro-Steam cleaner.

Equipment Cleaner

■ A portable equipment cleaner that jets out 1,200 gallons of hot water an hour at 240 pounds pressure is made by the Vapor Heating Corp., 6420 W. Howard St., Chicago 31, Ill.

The Vapor-Clarkson Hydro-Steam equipment cleaner, Model 4989-G, has an automatic 40-hp steam generator that develops 120 pounds working steam pressure in two minutes from cold water and over 1,100 pounds of steam per hour. The steam is directed through a Sellers injector where the steam heats the water and the pressure is increased by a venturi in the injector. The unit is mounted on a two-wheel trailer.

For further information write to the company, or use the Request Card at page 18. Circle No. 664.

Keyed Macadam Subbase With Vibratory Compactor

■ A self-powered vibratory tamper that has six shoes, each delivering 8,000 pounds of compacting force at 2,200 vibrations per minute, is illustrated in literature from the International Vibration Co., 16702 Waterloo Road, Cleveland 10, Ohio. The literature states that the Vibro-Tamper enables the contractor to lay a complete fully keyed macadam subbase in one course and has the power to compact it from 11 to 8 inches with over 95 Proctor in one pass.

Specifications, features, and action photos give a picture of the self-propelled machine's characteristics and uses.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 665.

Scarifiers for Dozers Save Waste Motion

■ A bulldozer backing up for a new bite can be doing work at the same time if equipped with a Preco back-rip scarifier. Literature available from Preco, Inc., 6300 E. Slauson Ave., Los Angeles 22, Calif. describes this equipment and gives details on a number of operations that it can speed up.

The back-up scarifiers are offered in several sizes to fit Caterpillar bulldozers and other bulldozers of comparable size. They consist of four curved shanks that mount on the back of bulldozer moldboards. Blading forward, the teeth float on top of the ground. Backing up, the teeth dig down 8 or 9 inches, ripping rocks, roots, and hard ground.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 570.

Line of Concrete Hoppers

■ Literature illustrating Gar-Bro hoppers for handling concrete is available upon request. The folder covers concrete receiving hoppers and floor hoppers.

The receiving hoppers are listed in both single and double-gate types and in vertical-front and center-discharge models. Capacities range up to 135 cubic feet for the double-gate units.

The floor hoppers are receiving hoppers mounted on a structural steel frame. They are designed to operate between the mixer and concrete carts to prevent delays.

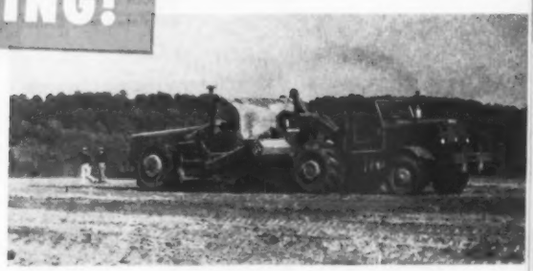
To obtain this literature write to the Gar-Bro Mfg. Co., 2415 E. Washington Blvd., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 667.

Schultz Promoted at Clark

Paul Schultz, appointed to a general staff position by Clark Equipment Co., Buchanan, Mich., will be responsible for standardization work in engineering and control procedures for the firm. Mr. Schultz has been with Clark, manufacturer of material-handling and construction equipment, for 20 years. He has served in both the industrial truck division and the automotive division.

Because of their tremendous power and traction, Euclid Twin-Power Scrapers get big loads easier and move more pay yards per hour than any other scraper of comparable size . . . they maintain high production on jobs where other scrapers just can't operate efficiently.

On a 2½ million cu. yd. section of the New York Thruway near Kingston, John Arborio, Inc. has used 7 "Twins" to move extremely difficult material . . . ranging from river sand to wet clay. On a complete cycle of about 8,000 ft. the "Eucs" moved up to 40% more bank yards per hour and maintained average travel speeds 2 m.p.h. faster than "high speed" competitive scrapers. The "Twins" had plenty of power and traction to haul loads of 17 bank yards on grades up to 20% . . . they made the return trip from the fill in a hurry, too, thanks to their two engines with separate Allison Torqmatic Drives. Arborio also used a Euclid Loader with a large fleet of Bottom-Dumps, and Rear-Dump "Eucs" on this job.



Owners everywhere say the Euclid Twin-Power Scraper is the most versatile "one man earth moving spread" they've ever seen. If you haven't seen "Twins" in operation, ask your distributor for a copy of the new descriptive folder, Form 551, before you bid your next job.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

CONSTRUCTION CAMERA

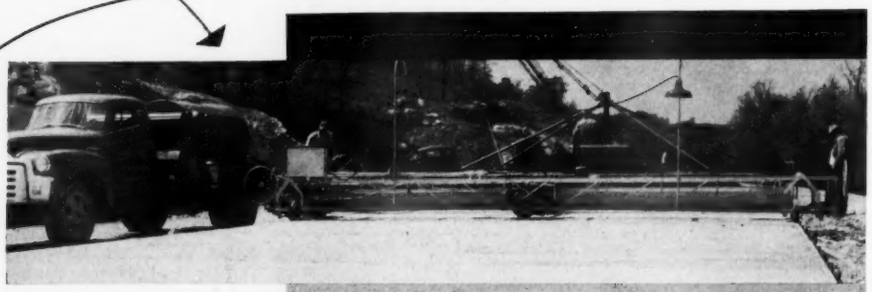
From a field of 68 entries, the American Institute of Steel Construction chose three spans as the most beautiful steel bridges opened to traffic in this country in 1953. Seven other structures won honorable mention in this 26th Annual Aesthetic Bridge Competition.

The three winners shown here, left to right, are for Class IV, movable bridges, Class II, bridges with spans under 400 feet and costing more than $500,000, and Class III, bridges with fixed spans under 400 feet and costing less than $500,000. This year, as last, no award was made for entries in Class I, for bridges with spans of more than 400 feet.

Class IV winner, chosen for its "simplicity of design and unadorned structural integrity," is the New York Central Railroad bridge over the Cuyahoga River in Cleveland, Ohio. The crossing was designed by Howard, Needles, Tammen & Bergendoff, New York, N .Y., and fabricated by the Mount Vernon Bridge Co., Mt. Vernon, Ohio.

WORLD'S LARGEST CONCRETE ROAD CUTTING JOB PROVES SUPERIORITY OF *CARDINAL BLADES!*

1,000,000 feet of West Virginia turnpike cut in record time—at lowest cost in history!



In cooperative effort with William F. Middlestadt of Seals, Inc., of Baltimore, who furnished equipment and personnel, CARDINAL NON-BRAK BLADES cut a 68 mile x 1½ inch longitudinal joint in this new two lane highway, and a 24 foot transverse joint every 18 feet . . . total—1,000,000 lineal feet through limestone aggregate. Job completed with CARDINAL NON-BRAK BLADES in record time at a record low cost.

Cardinal NON-BRAK BLADES
Lowest initial cost on the market—reinforced with steel and fiberglas for better cut and longer life.

Cardinal DIAMOND BLADES
33⅓% more cutability than conventional blades—25% lower initial cost.

When you work with CARDINAL, you work with blade men who know the concrete cutting business . . . men who will frankly tell you when a rugged, low-cost CARDINAL NON-BRAK BLADE will do the job on green concrete, at less cost than a diamond blade . . . or, when a CARDINAL DIAMOND BLADE will give you the best deal, cost-wise, on aged concrete or other hard specifications. More footage per day . . . less cost per cut—that's the kind of guarantee that makes good sense. Call, write or wire, today!

Cardinal
ENGINEERING CORPORATION
World's Largest Exclusive Manufacturer of Concrete Cutting and Masonry Blades
144 BURNSIDE STREET, PHILADELPHIA 27, PA., U. S. A
Branches or Distributors in Most Principal Cities

County Engineers Discuss Road Plans

The second national highway conference of county engineers and officials was held at Columbus, Ohio, September 13 to 15. Sponsored by the County and Local Roads Division of the American Road Builders' Association, the meeting attracted approximately 600 county highway officials from 30 states. Papers and discussions covered problems of county highway construction, maintenance, and administration.

In addition to the reports by highway officials, the delegates heard an address by Congressman J. Harry McGregor (R-Ohio) who is chairman of the House subcommittee on roads. The Ohio Representative reminded his audience that the Federal-Aid Highway Act of 1954 provides a $300 million increase, or 52 per cent over the preceding annual authorizations of $575 million, for the federal-aid systems. The act specifically authorizes $210 million annually for projects on the federal-aid secondary-highway system. This alone is a $45 million increase over the preceding authorization. "We hope," Congressman McGregor stated, "the State Highway Departments and other officials involved in the various states will assume their responsibility and assist in putting the program into effect."

The act recognizes the need for the improvement of all types of highways, according to McGregor, and the nearly $850 million, 2-year federal-state program, which will be gener-

TRANSITS AND LEVELS

You will find the best bargains at Warren-Knight, New or rebuilt—for sale or for rent—We will buy or trade your used transits, levels, alidades, etc. Send your instruments for valuation.

Write for free catalog EC-411 of instruments, field equipment and drafting room supplies.

Send for free Catalog EC-411

WARREN-KNIGHT
136 NORTH 12TH STREET PHILADELPHIA, PA.

Class II winner is the Ninth and Tenth St. Connections, Bayshore Freeway, San Francisco, Calif. Designed by the California Division of Highways and fabricated by Bethlehem Pacific Coast Steel Corp., San Francisco, the span was judged "the most imaginative entry."

Class III winner, the Robert Street Underpass, is a pedestrain crossing over the South Freeway in Fort Worth, Texas. Its "fine and graceful profile" played a part in the selection of this bridge. The Texas State Highway Department is the designer and the North Texas Steel Co., Inc., Fort Worth, the fabricator.

ated by the new law, places added responsibility in the hands of county engineers. The Congressman urged these county officials to establish or improve their engineering and administrative services, and to take advantage of the contract method wherever feasible in carrying out the enormous programs that lie ahead.

"Don't go hog-wild on force accounts or you will ruin the Highway Act of 1954," McGregor warned. "You're going to be in the road business more than ever before in the next few years. What you do during that time will determine whether these funds go back under federal control."

N. J. Adds Direction Signs To Highway Route Markers

By the end of next month, approximately 1,600 of the north, east, south, or west direction designations will have been attached to route markers along New Jersey highways. These new guides are currently being installed at the junction of principal roads and important interchanges between routes by the maintenance division forces of the State Highway Department.

Reflectorized direction markers are being set up at heavily traveled interchanges, and the non-reflectorized types are being added to route markers at other locations. Reflectorized and non-reflectorized signs measure 8×19 and 8×16 inches, respectively, and, with their high degree of visibility, permit motorists to make a quick selection of routes while driving.

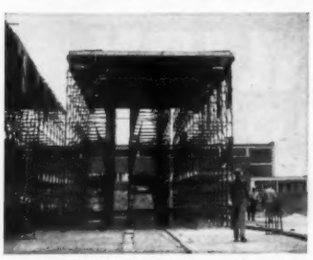
New Technique For Shoring—*It Rolls!*

The contractor on this job really saved by erecting shoring units with Ezebilt Scaffold-for-Shoring panels, mounted them on adjustable screw-jacks like this—

After the first slab was poured, (at 21 ft. height) the entire shore-unit was lowered on the casters, and rolled on to the next bay—with the forms intact.

Here were his savings: one rolling rig shored 4 slabs—eliminated tearing-down and re-erecting shoring *three times*—with no re-handling or re-setting of forms. He also saved on erection time, his scaffold-shoring went *'Up Faster'* with Ezebilt's Gravity-Lock mechanism. *You can save on any shoring job* with Universal Scaffold-for-Shoring—then use the same panels for mason work.

Ezebilt SCAFFOLDING



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In a Hayward, there's no contact between the closing mechanism and the material handled. This "no contact" feature is a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

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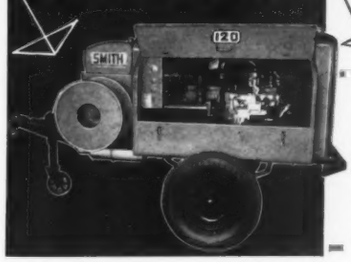
USE THE SMITH 120-P COMPRESSOR



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Be thrifty . . . *save* your big compressors for *big* jobs . . . then use the Smith 120-P for the majority of your compressor work. Heavy-duty Chrysler engine has 413 cu. in. displacement. Simple, compact compressor design—no coupling or clutch. Compressor pistons operate at 120° apart for smooth, even flow of air. Corrosion-free manganese bronze compressor valves with stainless steel discs. Finned aftercooler reduces air temperature approx. 200°, gives longer hose life!

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POWER AUTHORITY OF THE STATE OF NEW YORK

ADVERTISEMENT FOR PROPOSALS

FOR

THE FABRICATION AND ERECTION OF THE SUPERSTRUCTURE FOR THE BARNHART ISLAND BRIDGE OVER THE ST. LAWRENCE RIVER NEAR MASSENA, ST. LAWRENCE COUNTY, NEW YORK

SPECIFICATIONS NO. 5422-C
ST. LAWRENCE CONTRACT NO. 6

★★★★

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the fabrication and erection of the superstructure for the Barnhart Island Bridge over the St. Lawrence River, near Massena, St. Lawrence County, New York, until 10:30 A.M., Eastern Standard Time, on the 7th day of December 1954, at 270 Broadway, Room 1207A, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineers, Praeger-Kavanagh, 126 East 38th Street, New York, New York; The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

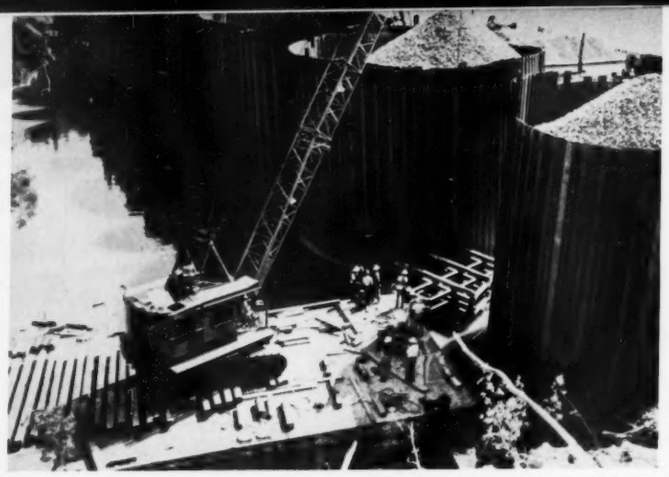
Plans, specifications and Proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, on or after November 15, 1954, upon application and pre-payment of a fee of Forty Dollars ($40.00) per set, no part of which will be refunded. Extra sets of plans at $20.00 each or specifications at $20.00 each may be obtained by any contractor who purchases a full set.

Bids must be made upon the proposal forms included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the Power Authority of the State of New York for the sum of One Hundred Fifty Thousand Dollars ($150,000.00).

The right is reserved to reject any or all bids.

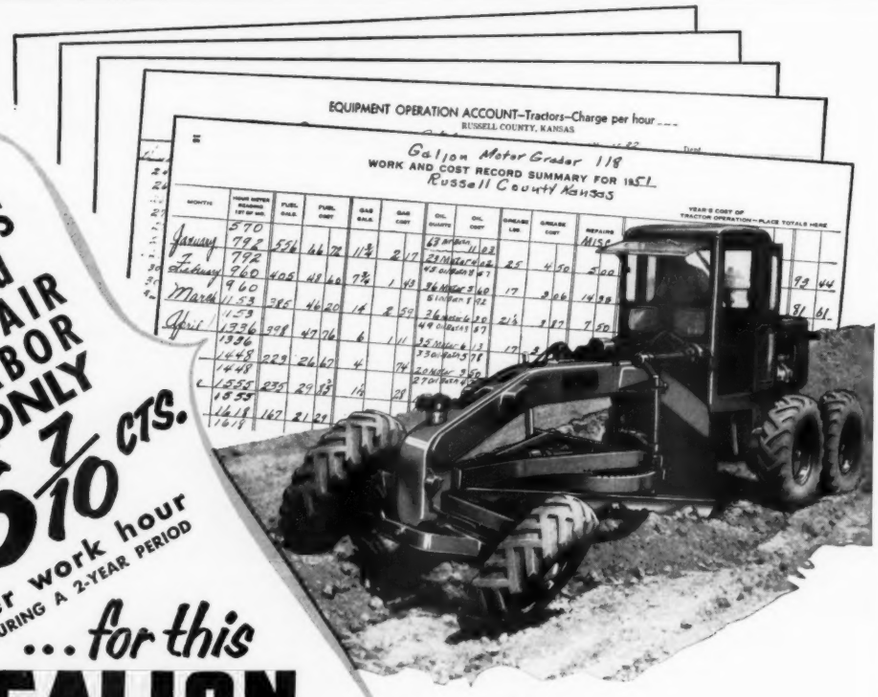
W. S. CHAPIN
GENERAL MANAGER

CONSTRUCTION CAMERA



Start on Powerhouse—Working areas for the $8,950,000 powerhouse on the Columbia River at Old Hickory, Tenn., are sealed off by 11 cellular cofferdams, built of L. B. Foster sheet piling. About 4,500 cubic yards of sand and aggregate fill each cell. Farnsworth & Chambers Co., Inc., Houston, Texas, is the contractor.

Relocation Job—Primary and secondary units on this Universal 880 rock crusher are combined into one machine to produce 3,500 tons of aggregate daily for the relocation of Minnesota State Route 65. The equipment, operated by the Ray Fischer Construction Co., Farmington, Minn., is powered by a GM 6-100 diesel engine.


EQUIPMENT OPERATION ACCOUNT–Tractors–Charge per hour
RUSSELL COUNTY, KANSAS
Galion Motor Grader 118
WORK AND COST RECORD SUMMARY FOR 1951
Russell County Kansas

PARTS and REPAIR LABOR ONLY 6 1/10 CTS. Per work hour DURING A 2-YEAR PERIOD

...for this

GALION MOTOR GRADER

Maintenance costs are watched carefully in the Russell County Highway Department in Kansas. Quality of equipment design and construction are quickly reflected on the detailed "Work and Cost Record" sheets kept by this county.

They reveal that for 1951 and 1952 the total repair costs *(parts and labor)* for their GALION 118 Grader amounted to only $245.79. Prorated over the 2-year total of 3,679 recorded work hours for this grader, gives the amazingly low repair cost figure of 6–7/10 cents per hour. That's the kind of service record that SAVES MONEY!

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THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio

Nuclear-Power Plant Being Built by Army

A full-scale experimental nuclear-power plant, designed and built jointly by the U. S. Army Corps of Engineers and the Atomic Energy Commission, will be located at Fort Belvoir, Va.

The Army Package Power Reactor —APPR—as the plant has been designated, is the prototype of a "package" or transportable power reactor which is being developed for use at remote bases to eliminate the need of transporting conventional fuels. The plant will also provide a training facility that can be used by the Army Engineer School at Fort Belvoir.

The pressurized-water-type reactor will be built within the exclusion area of the Engineer Research and Development Laboratories. The plant, with a capacity of approximately 1,700 kilowatts of electricity, will be built of components transportable by air.

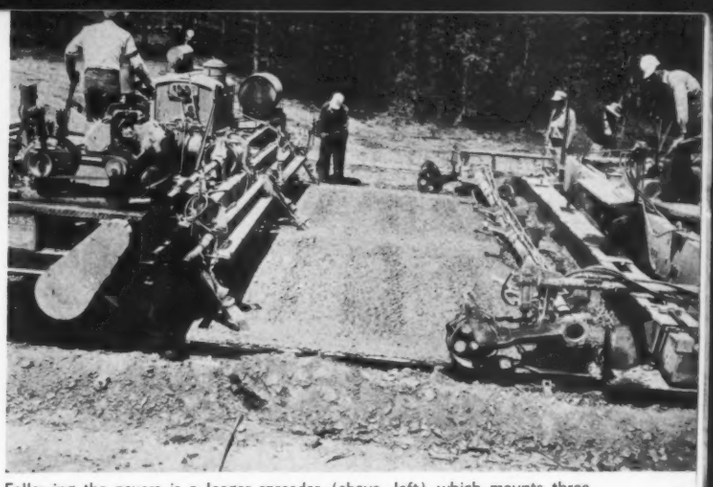
Future plants are expected to provide heat for space heating, in addition to electricity. The model will provide construction, operation, and maintenance data and will demonstrate the capabilities and limitations of the plant.

New Booklet Discusses City Traffic Problems

"City Traffic Muddle—What Exits?", a new booklet, has been released by the National Highway Users Conference. Liberally illustrated and printed in two colors, the booklet presents the views of four experts: Henry A. Barnes, director of traffic, Baltimore, Md.; Glenn C. Richards, general superintendent of the Department of Public Works, Detroit, Mich.; DeWitt C. Greer, Texas state highway engineer; and David L. Lawrence, mayor of Pittsburgh, Pa. The quartet participated in a panel discussion on the subject at the recent Fifth Highway Transportation Congress in Washington, D. C.

Some solutions to serious urban traffic congestion, such as the construction of expressways and better use of existing facilities, are presented.

Copies of the booklet may be obtained by writing to the National Highway Users Conference, National Press Building, Washington 4, D. C.



Tight Paving Spread—In order to keep the subgrade smooth, Koss Construction Co., Des Moines, Iowa, operates two Koehring 34E pavers from the shoulders of U. S. 67 near Festus, Mo. The paving job, (See "Complete Service Setup Maintains Paving Spread" on page 6 of this issue) is being done for the Missouri State Highway Department.

Following the pavers is a Jaeger spreader (above, left) which mounts three Jackson vibrators. These, together with the Jackson vibrator tube on the front of the Jaeger finisher (right) consolidate the concrete. Power for the vibrators was supplied by Jackson generators on the spreader and finisher.

Water Supply and Disposal

Fundamentals and new advances in the field of water sanitation are treated at length in a new book, "Water Supply and Waste-Water Disposal", published by John Wiley & Sons, Inc., New York, N. Y. The 1,000-page work represents the combined efforts of two professors of sanitary engineering and a professor of sanitary chemistry.

An integrated discussion of the applications of scientific principles and engineering techniques in the field of water sanitation is presented. The first half of the book deals with the collection and distribution of water and the collection and removal of waste water. The second half covers the treatment of water and waste water.

Subjects carefully treated include collection of surface and ground water, water supply and drainage of buildings, flow in sewers and their appurtenances, and water supply and disposal systems.

Gordon M. Fair of Harvard University, John C. Geyer of Johns Hopkins University, and John C. Morris, associate professor of sanitary chemistry at Harvard, are the authors. The book is priced at $15, and may be ordered from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

Army Engineers Develop New Training Program

A unique plan for the training of mobilization reserve engineers was adopted during the summer field training at the U. S. Army Corps of Engineers' New York District installation. The training program was tailored to the operation actually undertaken in the New York Engineer District in the original "Plan Plattsburgh", which is now being used in connection with construction of the Plattsburgh Air Force Base project.

Conducted in the form of a series of lectures, the training program consisted of providing background material on the problems and procedures in the design and construction of the base. A practical problem illustrating what had been discussed followed each lecture. Field inspection trips to two construction projects were included in the program, and a general critique of the problem was made at the end of the training period.

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Self-Propelled . . . and powered by 25 Horsepower . . . Clipper's new C-250 "ConSawMatic" cuts the MOST concrete for the LEAST cost per foot! Exclusive 3-Point Suspension on rugged 4-wheel chassis eliminates blade binding, reduces wear. Improved Screw Feed for **positive** Depth Control, essential with new GreenCon Abrasive Blades. Easy to handle, gets you "on the line" fast, ready to cut in a hurry. FREE TRIAL will show you why "4 Out Of 5 Buy Clipper"

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Savings you never dreamed of—as high as 80% with Clipper's new "GreenCon" Blades. Reinforced Abrasive Blades that knife through green concrete with limestone aggregate. Call or write Clipper today!

NEW Diamond Blades by Clipper—cut ANY concrete. There's new ease and speed in Clipper's **improved blade specifications...** for cutting green, cured or aged concrete. A blade for any job—any aggregate—every saw!

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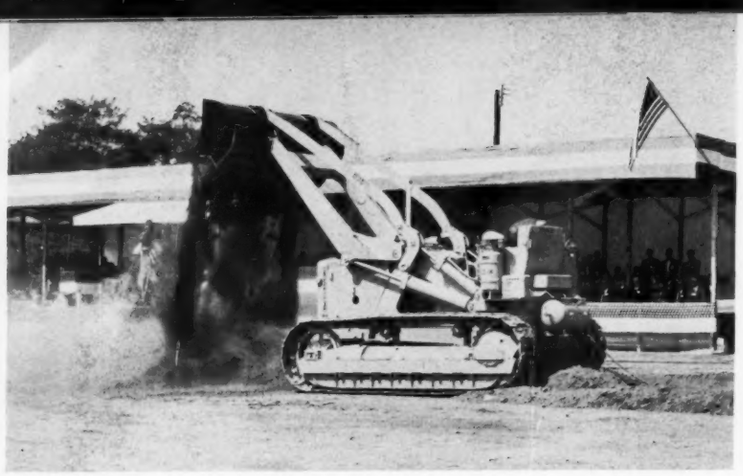
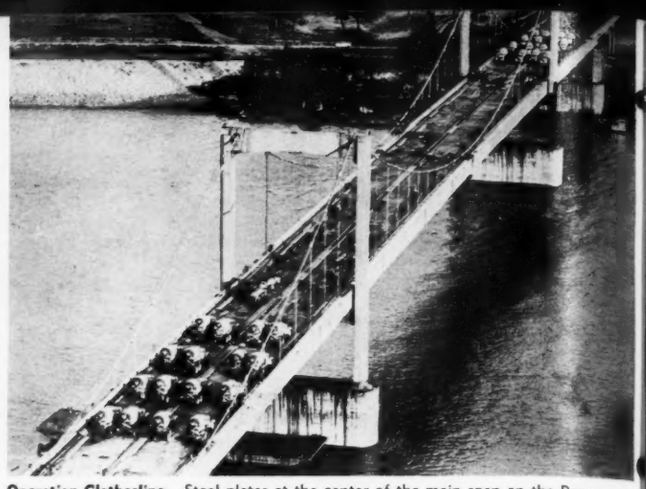
CONSTRUCTION CAMERA



Atomic Age Construction—Two cubic yards of earth dumped by this 14-ton Caterpillar No. 6 shovel mark the start of the $45 million atomiic power plant by Duquesne Light Co., and Westinghouse Electric Corp. at Shippingport, Pa. The shovel, working without an operator, was set in motion by President Eisenhower by remote control.



Operation Clothesline—Steel plates at the center of the main span on the Paseo Bridge across the Missouri at Kansas City are brought together as a fleet of International motor trucks is used to provide a counterweight of about 176 tons on each anchor span.

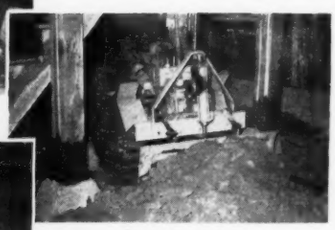
AGRICAT —The Contractor's New Money-Making Helper!

These AGRICAT Users Know

Since Henry Doelger, Builder, Inc. has been using AGRICATS on the beautiful new WESTLAKE Homes development in San rrancisco, they've been saving a minimum of "75 man-hours a day . . . at $2.10 per hour — that's quite a saving!"

"Now that we have used AGRICAT . . . we get the convenience of not having to use special equipment . . . we wouldn't be without it!"

Before: Unfinished basement area of new Westlake home—scores of labor man-hours required to clear and level.



During: Tight spots are a breeze for the Agricat, working here with a hydraulic dozer.

After: Cleared and level! Another basement area ready for paving with a fraction of the labor required before Agricat!

. . . and these users know too!

Agricat proves itself again — saves many man-hours of labor in back filling 250 ft. of septic tank ditch across golf course in California.

Agricat used by large wrecking company for everything from knocking down walls to lifting and loading on Detroit's Edsel Ford Expressway. "Agricat's so light and sure-footed it can be hoisted and used on upper floors, too!"

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SE11

Book on New Method Of Estimating Costs

A new technique of cost estimating for contractors, architects, and design engineers is described in "Estimating Production and Construction Costs", published by the Dallavia Co. The book, written by Louis Dallavia, is aimed at eliminating the guesswork involved in the indirect method of cost estimating used by most contractors—the method of applying unit labor costs of previous jobs to a new project and expecting production costs to average out.

The book contains 160 tables of specific production operations of construction, including earthwork, reinforced concrete, structural steel, masonry, and rough and finished carpentry. By using these tables, the author claims that a contractor can estimate costs more quickly and accurately than he could with the older method.

"Estimating Production and Construction Costs" is priced at $15 per copy, and can be ordered from the Dallavia Co., 2110 Elmen, Houston 19, Texas.

Army Engineers Supervise Seaway Work in U. S.

Supervision of U. S. construction operations for the St. Lawrence Seaway Project will be done by the U. S. Army Corps of Engineers, working with the St. Lawrence Seaway Development Corp. The Corps of Engineers will perform such services as acquiring land, preparing engineering plans and specifications, making recommendations and assisting in awards to bidders, and supervising construction operations delegated to it by the St. Lawrence Seaway Development Corp.

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade of slope on which he is working.

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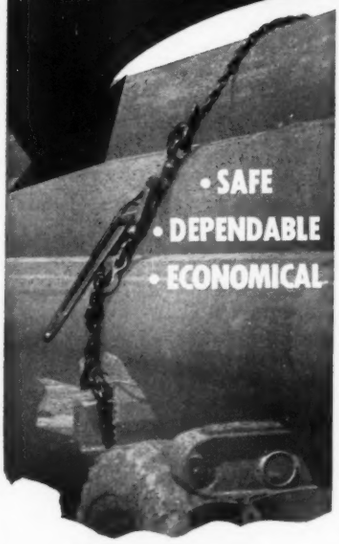

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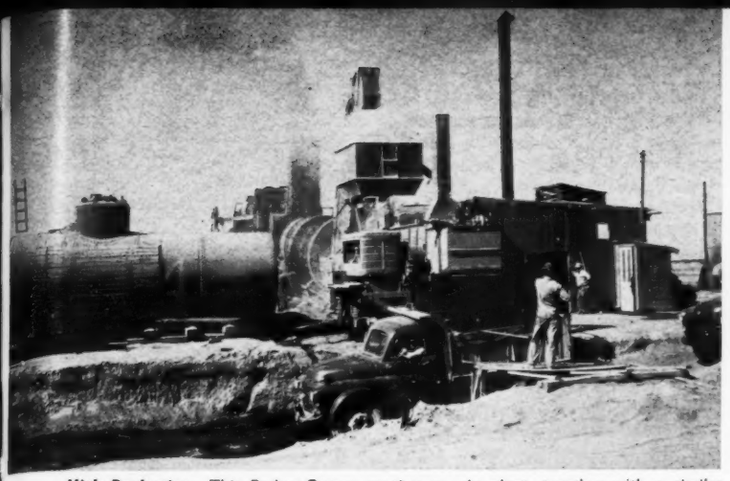

High Production—This Barber-Greene continuous-mix plant, together with a similar plant, combined to produce nearly 200 tons of asphaltic base-course every hour for paving work on the Garden State Parkway in New Jersey. Lizza & Sons, Inc., Oyster Bay, Long Island, N. Y., laid 3,000 tons of material daily on its 22-mile stretch.

Finishing Highway Link—Compaction of selected base material on the Wilbur Cross Highway in Connecticut is handled by a Galion 10-ton roller. M. A. Gammino Construction Co., Providence, R. I., holder of a $2 million contract for the 10-mile stretch of two-lane highway, expects to finish the job before the year's end.

Changes in Diesel Engines Increase Efficiency

■ Improvements have been made in the cylinder assembly of General Motors Series 71 diesel engines. The changes are intended to provide better fuel economy, increased horsepower in some sizes, and longer life for these power plants. A new bulletin issued lists these changes as a new cylinder liner which provides a freer flow of air into the cylinder, a new piston which increases the compression ratio, and longer-life compression rings. The new liner and piston are interchangeable with those formerly used and may be installed on engines now in service.

The new cylinder liner has air-intake ports which are figure 8 in shape. The openings are larger than those used in previous liners and their number has been increased so that there is now a 32 percent larger air-intake area than before. The improved piston is designed with a new combustion chamber to take full advantage of the better combustion available with the new liner.

A new high-valve injector, introduced earlier this year, that protects vital parts from high-cylinder temperatures is also described. Another development previously announced is the use of individual terne plate compressible rings said to give trouble-free sealing between the block and head at the cylinder.

To obtain this literature write to Detroit Diesel Engine Division, General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich., or use the Request Card at page 18. Circle No. 573.

American Bridge Appoints Mowlds to Executive Post

The new general contracting manager of the American Bridge Division, Pittsburgh, Pa., a subsidiary of the United States Steel Corp., New York, N. Y., is Eugene Mowlds, Jr., who has been associated with the division since 1927. Marion Chapman succeeds Mr. Mowlds as assistant general contracting manager.

From 1927 to 1932, Mr. Mowlds was assistant to the contracting manager of American Bridge at Baltimore, Md. He later served as contracting manager at Baltimore, and in 1944 was named contracting manager at Philadelphia. In 1950, he was made assistant general contracting manager.

Mr. Chapman was associated with the Virginia Bridge & Iron Co., before joining American Bridge in 1952. He has been serving as assistant to the vice president since that time.

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The small, simple but strongly built level, specially designed for building site work.

The instrument is equipped with mirror for bubble reading, tilting screw, jointed tripod head, and both bulls eye and 40 second tubular level. Internally focusing telescope—18x magnification. All optics AR Coated.

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CONSTRUCTION ESTIMATES TREATED IN A COMPREHENSIVE WAY. COMPLETE INFORMATION PROVIDED IN A VALUABLE REFERENCE BOOK.

CONSTRUCTION REPORT #432 ROCHE ESTIMATING METHODS

This is a practical and not an academic treatment of Construction Estimating Procedure.

The book is the work of W. Earle Roche, a Construction Consultant of Glendale, California, equipped with many years of actual construction and estimating experience, extending to many divisions of General Engineering and General Building Construction Work.

The book treats systematically in unusual detail all aspects of preparing construction estimates for contracting and engineering purposes, matters pertaining to construction costs, work investigations and the preparation of estimates and construction reports are treated and discussed in a comprehensive way.

There are parts devoted to public and labor relations, work programs, progress graphs, work schedules, construction materials and supplies, construction work item costs, general and indirect costs, and the costs of construction plant, machinery and equipment, in which these subjects are treated in considerable detail.

Examples of estimates of cost and reports, based upon actual construction projects, are liberally provided. This information is highly valuable to estimators, contractors, and to executives, who wish to insure orderly procedure in such matters. In fact, the entire procedure of preparing estimates of cost is treated step by step and is highly illustrated with data taken from many actual construction projects. Photographs of work, reproduction of plans, graphs, special estimating and report forms, check-lists, a glossary of terms, appear in a great variety of detail. Depreciations and factors that influence rental rates and construction plant USE CHARGES are also discussed and outlined with unusual clearness.

The procedure of classifying and making available information related to materials, supplies, institutional equipment and furnishings, work item costs, plant costs, and the typical operating costs of construction plant, is described and illustrated in a very comprehensive manner. An assortment of tables provide information relating to: weights of materials, conversion tables for metric and English measure, trigonometric tables, geometrical figures, symbols, map reading, and a great deal of data associated with estimating are also included, classified and arranged for quick use.

Legal aspects related to joint ventures and provisional articles of incorporations are treated and illustrated. Pricing of proposals for bidding purposes is discussed at length with actual examples of the procedure or arranging prices and amounts that will be to the advantage of the Contractor during the work performance period.

All parts and sections are generously indexed and cross-indexed, with a marginal quick finder index marker on every page. The publication is complete in every respect related to the preparation of construction estimates and reports. It is apparent from the practical aspects of the publication that it has been compiled by an author provided with a large amount of actual experience with construction work, and a keen knowledge of estimating procedure.

The price of this unusual publication is $100.00 delivered anywhere in the world served by Air Parcel Post or Air Express. The present edition is very limited, and may only be obtained from ROCHE ESTIMATING METHODS, 128 WESTERN AVE., GLENDALE (1), CALIF.

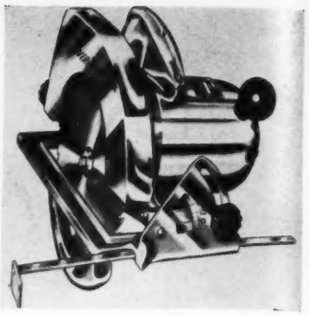
The Mastercraft line, a new series of five machinery-hauling trailers, features tilting platforms for easy loading. ►

New Hauling Trailers Feature Tilting Beds

■ A new line of low-bed trailers for hauling rollers, tractors, bulldozers, and other construction equipment is announced by Mastercraft Trailers, Inc., 300 Middlefield St., Middletown, Conn. The new line includes five models which range in capacity from ½ to 5 tons.

Tilting beds for easy loading and unloading are a feature of the new trailers.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 668.



Electric Power Saw Has Cooling Feature

■ A new addition to the Ram Tool line of portable electric saws is the Model PG85, a saw powered by a 1 1/3-hp ball-bearing motor. Weighing only 13½ pounds, the new Powerguide saw has a central-balance handle which allows the operator to use only one hand, while holding the wood with the other. A feature of the tool is the newly designed cooling system in the rear of the upper guard, minimizing motor heat.

The depth of cut is 3⅛ inches, or 2¼ inches at 45 degrees. A quick bevel and depth adjustment is easily accessible.

For further information write to the Ram Tool Corp., 411 N. Claremont Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 516.

New Booklet on Design Of Flexible Pavements

Flexible-pavement design is treated in research papers from six state highway departments which are included in Research Report 16-B of the Highway Research Board. Titled "Design of Flexible Pavements", the papers in the booklet discuss flexible pavement design as revised for heavy traffic, modified C.B.R. flexible-pavement design, the pavement's correlation with road performance, and the road design by the group-index method.

The six papers, contributed by members of the Texas, North Carolina, Missouri, Wyoming, Virginia, and Kansas highway departments, deal with experiences with pavements built in accordance with the different design methods.

In the last section of the booklet, four other researchers in the field conduct a general discussion of flexible-pavement design. Copies of the booklet, at $1.05 each, can be ordered from the Highway Research Board, 2101 Constitution, Washington, D. C.

High-Frequency Vibrator Keeps Equipment Clean

■ A high-frequency portable vibrator that contractors can use for concrete vibration, for keeping equipment free of accumulations of cement, and for unloading bulk materials is illustrated in a leaflet from The C & W Co., 1490 Franks Lane, Menlo Park, Calif.

The Vibraire, which uses 6 cubic feet of air per minute at 80 pounds pressure, was developed primarily for dumping bulk-cement trucks, but it is also recommended for use in transit-mix trucks, and in hoppers, etc. The unit clamps onto equipment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 669.

"Nothing equals ADAMS 660"
says WILCO BUILDERS

● The 140 hp. Adams "660" Motor Grader shown above is working on the Ohio Turnpike. It is owned by Wilco Builders, who say, "For ease of operation, power and output there is no comparison between the Adams "660" and any other grader we have owned. Its powerful engine enables us to get more work done with less effort."

Such owner satisfaction is making Adams *Improved* Motor Graders more and more popular with contractors and highway officials everywhere . . . for Adams Motor Graders give them more time-saving, work-producing advantages than any others on the market—*bar none!*

Let your near-by Adams dealer show you the model best suited to your needs.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

ADAMS offers 4 models, ranging from 75 hp. to 140 hp., all featuring these advantages:

- New Constant-Mesh Transmission
- 8 Forward Speeds
- 3 Creeper Speeds (optional)
- 4 Reverse Speeds
- Dual Braking System
- Rubber-Mounted Engine
- Foot Accelerator

Make your next motor grader an ADAMS

Oil Filter Attached By Tightening Clamp

■ A new oil filter, equipped with a single tightening device so that there are no nuts or bolts to bother with, is announced by W. G. B. Oil Clarifier, Inc., Kingston, N. Y. The W. G. B. Model WD-2 Clar-O-fier has a top that is held securely by a clamp and fits into the brackets used for almost any 750-cubic-inch filter. An O-ring gasket keeps the oil completely locked in, regardless of operating pressure. Cartridges can be changed in 3 minutes. For best results the W. G. B. Clar-O-fex replacement cartridge should be used with the new filter.

For further information write to the company, or use the Request Card at page 18. Circle No. 545.

Detailed Information On Excavating Equipment

■ A new edition of Bucyrus-Erie's general catalog describing the company's complete line of excavating and material-handling equipment has been released. The catalog features copy, condensed specifications, and over 100 photos of Bucyrus-Erie machines on specific jobs.

Sections describe ⅜ to 4-cubic-yard excavating machines, the all-hydraulic Hydrocrane, and water-well drills. Also included in the presentation are quarry and mine shovels in 2½ to 8-cubic-yard sizes; blast-hole drills; walking draglines in 4 to 30-cubic-yard capacity; and railway cranes, including a 250-ton diesel-electric crane.

To obtain Catalog GC-5A write to the Bucyrus-Erie Co., Box 56, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 587.

Loader Converts Trucks Into Self-Loading Units

■ The Lodal hydraulic overhead loader that mounts on any 2-ton dump truck is illustrated in a booklet from the manufacturer. While the machine is not designed for all jobs, it converts a truck into a self-loading unit that works efficiently in short-haul and scattered-yardage operations. Controlled from the truck cab, the loader is a one-man-operated machine.

The basic attachment is a ¾-yard bucket, available with an extension that increases capacity to 2 cubic yards. The booklet also shows a sweeper, a snow blade, a snowplow, and a refuse collector that add to the machine's uses.

To obtain this literature write to Lodal, Inc., Norway, Mich., or use the Request Card at page 18. Circle No. 628.

Report on Asphalt Paving With Welded Wire Fabric

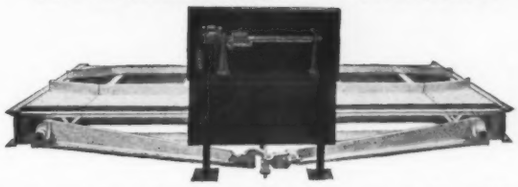
■ The use of asphaltic concrete reinforced with welded wire fabric as a resurfacing technique is reported on in a booklet from the Wire Reinforcement Institute, Inc., 1049 National Press Bldg., Washington 4, D. C.

The booklet traces the development of the process that combines the flexibility and low cost of bituminous-concrete topping with the crack prevention and ripple-control of distributed steel. Reports on applications in several states and municipalities follow, including spreading techniques, as well as results after several years of use.

A concluding report summarizes the experience gained in the new paving process to date and offers the Institute's recommended specifications for putting in sections of fabric-reinforced resurfacing.

For further information write to the Institute, or use the Request Card that is bound in at page 18. Circle No. 581.

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

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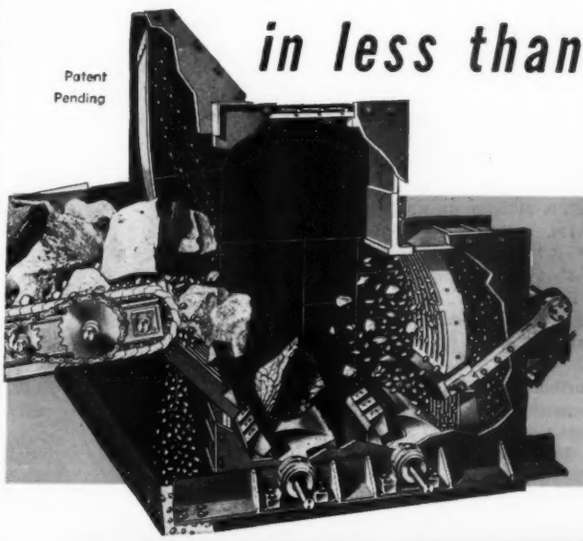

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Shovel loaded run-of-quarry rock is directed into the path of the rotor hammers to receive the smashing impact of a direct blow.

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All of the breaking is accomplished by the impact of rotor hammers upon the rock resulting in a cubical product of highest quality. Both rotors rotate in the same direction *with the flow of material* promoting fast feeding and fast discharge for top capacity. Incoming rock is struck a solid blow by the first rotor and finish size is instantly discharged. Oversize particles are struck by the second rotor and finish size is again quickly discharged.

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Three simple mechanical adjustments provide complete control over finished product. Size is governed by rotor speed. Various positions of stripper bar and lower screen grate give a wide degree of control over gradation. In closed circuit setups recirculating loads can be kept to a minimum.

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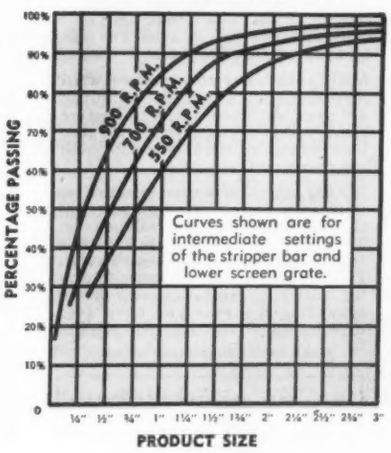

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Two-Way Payload—To haul big volumes, a cement producer in Los Angeles uses this full trailer paired up with another semitrailer model. Together, the two trailers haul up to 47,000 pounds to batching plants in the city. On the return trip they carry fuel oil. For details circle 647 on card at page 18, or write to Utility Trailer Mfg. Co., P. O. Box 3608, Terminal Annex, Los Angeles 54, Calif.

Tractor-Backhoe Team—Only 5 feet wide and 5 feet tall, the new TerraTrac-Pippin Special team works well in close quarters. With a reach of 16 feet, the hydraulic backhoe digs 10 feet below grade using buckets 12 to 40 inches wide. For details circle 646 on card at page 18, or write to either American Tractor Corp., Churubusco, Ind., or to Pippin Construction Co., White River Junction, Vt.

NEW! Mall

POW'R TROW'L

Exclusive Features New to Power Troweling

36" Ring $375.00 F.O.B. Chicago Factory

MALL—the first power trowel that delivers 97% of engine power to the trowel blades. New direct "in-line" transmission does it...no belts or pulleys to steal valuable power.

MALL—the first power trowel with interchangeable ring sizes...36" or 45" rings, with corresponding floating shoes, finishing blades and a 24" disc for dry tamp floors, can be used with one power unit.

MALL—the first power trowel that employs a new, extra sturdy trowel ring and arm design that will not sag. These, plus many other new, exclusive features, make the new MALL POW'R TROW'L the finest performing, easiest to handle gasoline driven troweling machine you have ever experienced. GET DETAILS NOW.

MALL Nation-Wide Factory-Owned Service Warehouses Assure Fast, Dependable Service.

MALL TOOL COMPANY 7743 S. Chicago Ave. Chicago 19, Illinois

Send me full details and prices on the NEW MALL POW'R TROW'L.

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*Firm*_____

*Address*_____

CU-112

Wider Application Of New Truck Engine

■ The new high-torque 201-hp International Royal Red Diamond 501 engine is now offered optionally for 4 and 6-wheel International chassis on which smaller Red Diamond engines are standard. The availability of this engine for these truck models provides them with the power of 430 pound-feet of torque delivered at 1,000 to 1,800 rpm.

International trucks for which the RD-501 engine can now be specified include the four-wheel Models R-210, R-211, and R-212; the six-wheel RF-190, RF-191, and RF-192 standard models, and RF-195 Roadliner; and the six-wheel RF-210, RF-211, RF-212, and RF-214 models. The heavy-duty engine is standard on R-220 models and cab-over-engine CO-220 models.

For further information write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 571.

ARBA Asks Road Industry To Survey Work Potential

Segments of the highway construction industry have been asked in a resolution by the American Road Builders' Association, Washington, D. C., for an appraisal of their ability to carry out the multimillion-dollar highway-construction program proposed by President Eisenhower, as well as for information on potential bottlenecks in production and proposed remedies.

ARBA has offered its facilities for receiving data from the industry, and for presenting the compiled information to committees of Congress and governmental agencies.

Linbrock Construction Co. DECALS for TRUCK DOORS

Coastal Line Construction Co. Inc. Electrical Contractors

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LESS THAN 2 PER SET

✓ FINEST QUALITY
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THERE'S AN INSLEY WORKING NEAR YOU

INSLEY TYPE K WITH CLAMSHELL ATTACHMENT

The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted —gasoline, diesel or electric power. For full information on the Insley Line write the Insley Manufacturing Corporation, Indianapolis 6, Indiana.

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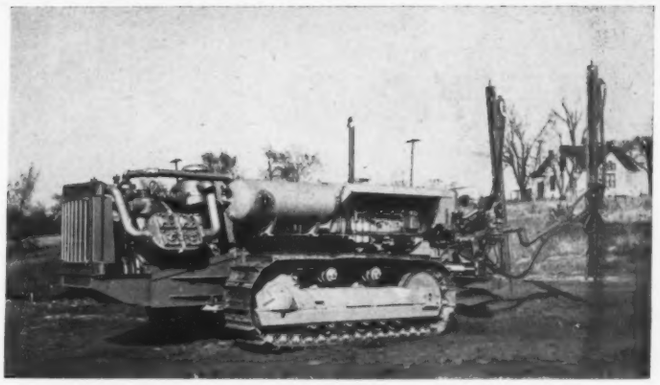
Use the Request Cards Between Pages 18 & 19 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

Revolving-Drum Mixer—The 3½-yard Model 35 is the latest addition to the Rocket truck-mixer line. These mixers have a hydraulic chute control with an attached "flip-flop" chute and an extension chute. A Timken-Detroit reduction unit and a choice of engines are other features. For details circle 643 on card at page 18, or write to Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.



Mobile Drilling Unit—This self-contained drilling outfit consists of Gardner-Denver rock drills on long-feed mountings, hydraulic booms, and an air compressor for powering the drills, all mounted on a Caterpillar D8 tractor. Gardner-Denver power-takeoff-mounted compressors come in 315 to 600-cfm sizes. For details circle 644 on card at page 18, or write to Gardner-Denver Co., Quincy, Ill.

Book Treats Problems Of Site Engineering

Problems that arise in the analysis of building sites and preparation of site plans are treated in a new book, "Simplified Site Engineering for Architects and Builders", published by John Wiley & Sons, Inc., New York, N. Y. In 250 pages, the work deals with the technical material used in performing office computations that result from surveying data.

Interpretation of deed descriptions, difficult dimensioning of buildings and sites, operation of surveying instruments, analysis and computation of specific data relating to a site, and other subjects are carefully explained and illustrated with examples.

"Simplified Site Engineering for Architects and Builders" is the work of two University of Pennsylvania professors: Harry Parker, professor of architectural construction, and John W. MacGuire, assistant professor of architectural engineering. The book is priced at $5, and may be ordered from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

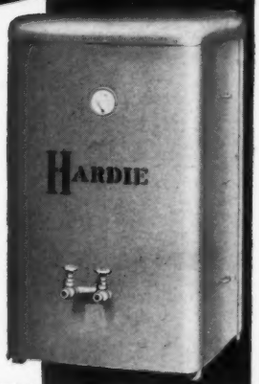
Choosing the Right Tools For Masonry Drilling

■ Picking the right kind of bit and the proper drill is important for efficient masonry drilling. A folder available from New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass., gives specific recommendations for drilling soft, medium-hard, or extremely hard masonry. Suggestions for all sizes of holes are given.

The four types of carbide-tipped masonry bits manufactured by this company provide equipment for all phases of one or two-man masonry drilling. The Cyclo-twist is for rotary drilling of soft and medium masonry; the Cyclo-Core is recommended for rotary drilling of hard masonry; and the Thunder-twist and Thunder-Core are made for hammer drilling of extremely hard masonry.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 588.

QUICK, EASY, LOW-COST CLEANING of ALL HEAVY EQUIPMENT UNITS



- **A solid, driving, high pressure stream that strips the caked mud, grease and dirt from vehicles, machines and all other equipment.**
- **A high pressure spray that licks the dust, dirt and grime from any surface.**
- **A fine fog mist that dissolves the dirt from fragile things and places.**

These you get from a Hardie High Pressure fully enclosed pump and motor unit, available in capacities from 5 gpm at 300 psi to 24 gpm at 400 psi. Pump and motor units up to 60 gpm at 800 psi for all liquids, chemicals and semi-liquid materials. Enclosed models provide easy accessibility to operating parts. All Hardie pumps are trouble-free, rugged, vertical piston-type pumps that work to their ratings smoothly, quietly, at slow speed.

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For RAPID, ACCURATE BATCHING . . .

THURMA-Tronic SCALES

Readily adaptable for all Batching Plants . . . OLD or NEW!

APPLICATIONS

The Thurma-tronic batching system* is adaptable for use in all concrete and asphalt batching plants. This new electronic batching system is not only available for new batch plants but also is adaptable for ALL existing plants. If you wish to increase production and reduce batching costs of your batch plant, it pays to investigate the money-saving advantages of the automatic and accurate Thurma-tronic batching system.

SPECIAL FEATURES

FOR ALL BATCHING PLANTS . . . OLD or NEW

The Thurma-tronic batching system may be used on any existing plant as well as on original installations.

UNLIMITED INGREDIENTS and FORMULAS—Because of the electronic design, any number of materials may be controlled. In addition, any number of preset formulas may be weighed by the Thurma-tronic batching system. Changes in formulas are quickly made by resetting the dials.

RAPID WEIGHING—The Thurma-tronic batching cycle is accomplished in a matter of seconds. This system may be set by the operator for one batch, continuous batching or any specific number of batches.

VERSATILE—The Thurma-tronic batching system is adaptable to either accumulative or consecutive weighing batch plants.

SERVICE—Because this is an electronic unit, based on the same principle as radio, any competent radio repairman can check tubes and make repairs in the event servicing becomes necessary.

ACCESSORIES—Strip chart recorders, one turn dials and other modifications are available for specific requirements of any batching operations.

* Patent Pending

Complete information on Thurma-tronic batching systems is available by writing for Bulletin 701. If, however, you have a specific batching problem, give us general information and our engineers will be glad to work-out the details with you.

THURMAN MACHINE COMPANY
Precision Products Since 1918

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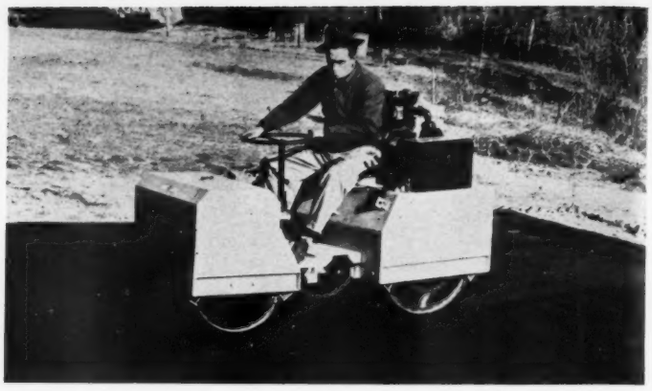
Paver Performs—A Blaw Knox P-150 base paver is shown on the Toledo Expressway, where it spreads screenings in 15½-foot-wide courses. Depth before rolling was 9½ to 10 inches. In a 10-hour day the paver, which features hydraulic single-wheel steering, spread 400 tons over 7,200 linear feet. For details circle 645 on card at page 18, or write to Blaw-Knox Equipment Division, Pittsburgh 38, Pa.



Utility Roller—Introduced last spring, the 1-ton Model 125 Motoroller has been found to be just right for jobs such as compacting driveways, parking areas, and other bituminous surfaces. Some contractors use it for sealing larger hot-top surfaces before compacting them with 3 to 5-ton rollers. For details circle 642 on card at page 18, or write to Gabb Special Products, Windsor Locks, Conn.

Electrode Developed For Aluminum Welding

■ A new welding electrode for inert-gas shielded-arc welding of aluminum is announced by the Aluminum Co. of America, 738 Alcoa Bldg., Pittsburgh 19, Pa. The new electrode was designed to be used in the welding guns employed with existing consumable-electrode shielded-arc processes. These processes include: Air Reduction Sales Co's. Aircomatic process; General Electric Co's. Fillerarc process; and Linde Air Products Co's. Sigma process. The Alcoa I. G. welding electrode can also be used for tungsten-arc welding where the filler wire is fed mechanically to the work.

The new electrode is currently being produced from three aluminum alloys—2S, 43S and A54S. It is packaged and stocked on non-returnable fibre spools in the following wire sizes: .030, .040, 3/64, 1/16, 3/32, and ⅛-inch diameters. In addition to these standard sizes, mill quantity orders are available in all wire sizes from .020 inch to ⅛ inch.

For further information write to the company, or use the Request Card at page 18. Circle No. 530.

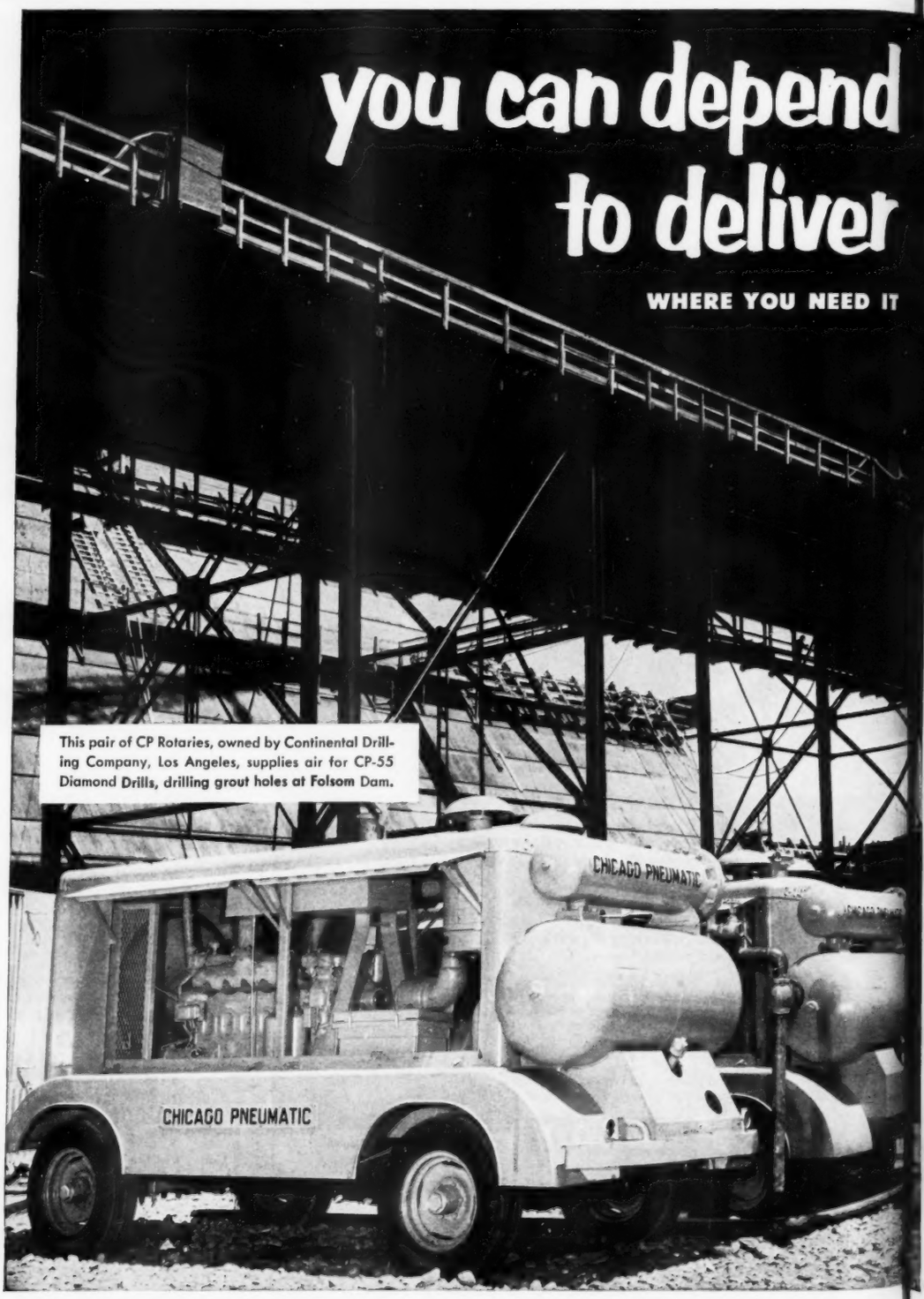
Portable Concrete Plant Designed for Small Pours

■ Small pours of from 100 to 150 cubic yards per day can be handled economically with the Auto-Crete plant described in a booklet from Auto-Crete, P. O. Box 1521, Phoenix, Ariz. All the components for the concrete mixing and batching operation are mounted on a semitrailer that is pulled to the job by any 1½-ton tractor-trailer.

To make this mobility pay off, the plant was designed for fast set-up. The claim made is that a two-man crew can set it up in less than an hour, and the booklet describes and illustrates how this can be done in 6 steps.

The portable plant is complete with mixer, 13-ton sand and gravel bins and a cement bin, conveyors, scales, electric controls, an aerator, and a water pump. A skid-mounted drive-in-type bulk cement silo is also described.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 565.



This pair of CP Rotaries, owned by Continental Drilling Company, Los Angeles, supplies air for CP-55 Diamond Drills, drilling grout holes at Folsom Dam.

Smooth Power—Leading front-end loaders now have torque converters to reduce gear shifting and eliminate shock loads. The Jaeger Model LP-100 Load-Plus, a 55-hp 1-yard loader, has a Fuller Model 12-A torque-converter that adjusts power to the load. For details on the advantages of torque converters, circle 648 on card at page 18, or write to Fuller Mfg. Co., Kalamazoo, Mich.

Pipeline Ditcher—Powered by a 147-hp GMC diesel engine, the crawler-mounted Middle-Incher ditcher makes a 46-inch-wide cut down to 7½ feet deep. Top travel speed is 3.8 mph. A hydraulic system and a torque-converter drive keep power flowing smoothly to the digging wheel. For details circle 641 on card at page 18, or write to Crutcher-Rolfs-Cummings, Inc., P. O. Box 2073, Houston 1, Texas.

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...ED IT WHEN YOU NEED IT

The ability to operate thousands of hours without time out for repairs has won ready acceptance for CP Rotary Portable Compressors throughout the construction industry. Their freedom from vibration, compactness and light weight, low oil consumption and low air discharge temperature are but a few of the characteristics that appeal to compressed air users everywhere. They're available with Hercules gasoline engines in capacities of 125 and 210 cfm.; and General Motors diesel engines in capacities of 210, 365 and 600 cfm. For detailed information, write for Bulletin 734. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

◀ Here's another team of CP Rotaries. This time they're ganged up to meet air demands at a power project in North Carolina.

◀ This dependable CP Portable Rotary is furnishing air for pile driving at Encinal Terminal in Richmond, California.

Capacities: 125, 210, 365, 600 cfm.

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Chicago Pneumatic

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Mobile Radios Convert To Base-Station Use

■ Two-way mobile radio systems that can be used as base stations with a new adapter and control unit have been developed by the Allen B. Du Mont Laboratories, Inc., 1500 Main Ave., Clifton, N. J. The new control unit enables two of Du Mont's three mobile systems, the 25-54 and 144-174 megacycle two-way radios, to be converted from battery to 117-volt ac operation for convenient base-station use. The adapter control unit also makes possible easy bench testing of the two-way systems without the use of batteries or battery eliminators.

For further information write to the company, or use the Request Card at page 18. Circle No. 623.

Snow-Removal Equipment For Graders and Tractors

■ A new booklet that gives complete specifications for all Baker snowplows for Allis-Chalmers motor graders and wheel tractors is available from Baker Mfg. Co., 2573 S. 10th St. at Stanford, Springfield, Ill. Design and performance characteristics are given for each model.

Getting down to details, the booklet describes the types of lift available, including hand-hydraulic, power-hydraulic, scarifier, or mechanical. It also illustrates extension wings and the features of sectional tripping blades.

To obtain Bulletin No. 1060 write to the company, or use the Request Card at page 18. Circle No. 611.

Booklet on Dump Bodies And Hydraulic Hoists

■ A catalog describing its Model 12N-5 bodies and Model 800T, 880, and 77353 hydraulic hoists is announced by the Galion Allsteel Body Co., Galion, Ohio. Features of these Galion products are described, with emphasis on construction and mechanical details. Complete specifications are shown. Illustrations include cutaway views, line drawings and action photos.

Model 12N-5 bodies are offered in lengths of 11 to 14 feet. Hoist ratings range from 14 to 25 tons.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 625.

DISTRIBUTOR DOINGS

"Quick-Way" Expands New Zealand Activities

To meet the need for heavy construction equipment brought on by the increasing rate of construction and industrial building within that country, a shipment of eight "Quick-Way" truck shovels has been sent to Frederick W. Smith, Ltd., Wellington, New Zealand. The Smith firm will distribute the shovels through its 23 dealer outlets. The machines are products of the "Quick-Way" Truck Shovel Co., Denver, Colo., a subsidiary of Industrial Brownhoist Corp., Bay City, Mich.

Highway Equipment Co. Names Two Pa. Dealers

Exclusive contracts in their respective areas have been granted to two Pennsylvania dealers, the Stewart Equipment Co., Inc., Harrisburg, and the Brinker Supply Co. of Pittsburgh, by the Highway Equipment Co., 616 D Ave. N. W., Cedar Rapids, Iowa.

Both companies will handle the complete line of Hi-Way spreaders—Stewart in eastern Pennsylvania, and Brinker in the Pittsburgh trade area, part of West Virginia, and Maryland.

Clark Names Six Dealers

The Michigan line of excavator cranes and tractor shovels, products of the Construction Machinery Division of Clark Equipment Co., Buchanan, Mich., will be sold and serviced by six new dealers.

Ed Meyer Tractor Co., Mount Vernon, Ill., will handle southern Illinois; Linder, Cox & Co., Lakeland, Fla., central Florida; and Dempster Brothers, Inc., Knoxville, Tenn., eastern Tennessee and northwest Georgia. Standard Equipment & Supply Co., North Little Rock, is the Arkansas dealer; and the two Texas distributors are Power Equipment Co., Lubbock, for the northwest, and Wilson Equipment Co., Odessa, for the west-central area.

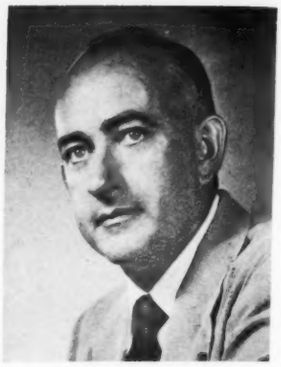
The newly formed Long-Talbott Equipment Co., 820 Blossom St., Columbia, S. C., will sell and service the Michigan line of excavator cranes and tractor shovels, in the entire state of South Carolina.

Handling the company's line of fork trucks, straddle carriers, and other material-handling equipment manufactured by the industrial truck division is Morgan's, Inc., 111 W. Broad St., Savannah, Ga. The dealer will sell and service the Clark line in 19 counties.

At the same time, the territory of the Bode-Finn Co., Cincinnati, Ohio, has been enlarged to include 20 counties in central Ohio.

New Onan Distributor

The Industrial Engine & Parts Co., 2345 S. Crawford Ave., Chicago, Ill., has been appointed by D. W. Onan & Sons Inc., Minneapolis, Minn., to handle the entire Onan line of electric generating equipment, including engines.



Roy T. Sorrell, owner and general sales manager of Southern Diesel Sales.

Florida Firm Named Dealer For Detroit Diesel Engine

Southern Diesel Sales, 529 Palm Beach Blvd., Fort Myers, Fla., has been appointed by the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich., to handle GM diesels in the area.

Owned and managed by Roy T. Sorrell, Jr., the company formerly operated as a service branch of Florida Diesel Engine Sales.

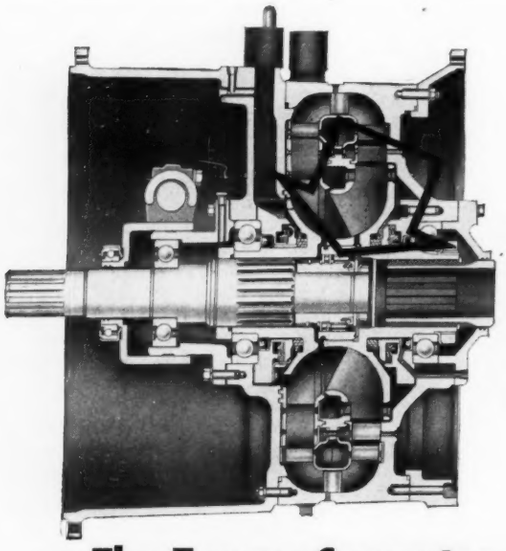
Penn Names Representative

Thomas W. Uhl has been appointed sales representative in the Borough of Queens, New York, N. Y., by the H. O. Penn Machinery Co., Inc., dealer for Caterpillar Tractor Co. products. He succeeds Stanley E. Wardell, who has been made sales promotion manager.

Nebraska Dealership Formed

A partnership in the firm of Midwest Machinery & Supply Co., 2200 Y St., Lincoln, Nebr., has been formed by Mrs. Dorothy L. Boyle and I. L. Gebhard. Mr. Gebhard was formerly associated with nationally and internationally known contractors in an administrative capacity.

The Lincoln firm represents manu-



Twin Disc freewheel locks impeller and turbine together to provide absorption of braking horsepower by the converter. In locking the impeller to the turbine, the freewheel forces the truck's driving axle to turn the converter pump wheel — providing smooth, powerful Hydrodynamic Braking.

The Torque Converter with

Built-in Braking!

This Dart Model 140 mining truck (above) climbs 15% grades with 22-ton payloads in one gear—comes back down without pedal-braking—by utilizing up-to-6:1 Converter Drive and built-in Hydrodynamic Braking of Twin Disc Model CF Three-Stage Truck-Type Torque Converter (shown above in cutaway). Request Bulletin 501.

When you specify torque converters for your heavy-duty off-highway trucks, be sure to get the *extra* advantages of Twin Disc Three-Stage Truck-Type design, with *built-in* Hydrodynamic Braking *at no extra cost.*

Pioneered by the Twin Disc Clutch Company, Hydrodynamic Braking in the Model CF Torque Converter is actuated automatically when the operator lets up on the accelerator. No accessory equipment or additional cooling system for braking is required.

Here is the most effective Torque Converter downhill retarding ever developed . . . smooth, effortless braking that gives your operators *complete control all the way down.* And by combining built-in Hydrodynamic Braking with friction braking of the engine, Twin Disc offers *maximum* downhill retarding *without shock-loading the transmission.*

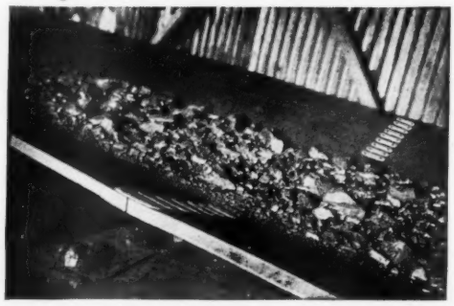
Add the powerful torque multiplication of Twin Disc Three-Stage design (up to 6:1 at stall, highest in the field) and you have virtual *elimination* of uphill shifting as well as of downhill pedal-braking . . . providing *faster work-cycles with more payloads hauled per day — lower ton-mile costs* — and *savings on engine, tires, brakes, and drive-line components.*

TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois

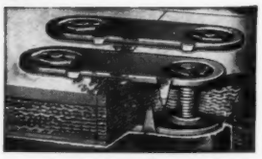
FLEXCO®

BELT FASTENERS and RIP PLATES



FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO., 4608 Lexington St., Chicago 44, Ill.

CONTRACTORS AND ENGINEERS

A group of 15 German and Swiss building contractors and equipment distributors, in this country to visit construction sites of dams and highway projects, are shown here as they attend a demonstration of the Michigan power shovel at the Benton Harbor, Mich., plant of the Clark Equipment Co.

facturers of air compressors, air tools and accessories, concrete equipment, pumps, mixers, and wire rope, and is expanding its sales and service activities to acquire additional lines of construction and industrial equipment.

Euclid Names Arizona Dealer

Min-A-Con Equipment Co., 1914 E. Buchanan St., Phoenix, Ariz., has been appointed a dealer for the state by the Euclid Division of General Motors, Cleveland, Ohio.

The new dealer will provide sales, service, and parts facilities for the complete line of Euclid earthmoving equipment for all counties except Apache and Mohave. Leonard Beck is president of the firm.

New Warco Distributor

Credle Equipment, Inc., Utica, N. Y., and its branch at Potsdam, have been named distributors of Warco motor graders by the W. A. Riddell Corp., Bucyrus, Ohio.

Sales and service facilities, for an area stretching from the Canadian to the Pennsylvania border, will be made available from these two offices in central New York State.

New Insley Distributor

Announcement of the appointment of the John C. Louis Co., Inc., 511–517 W. Pratt St., Baltimore, Md., as a distributor for the Insley line of excavators, cranes, and concrete-handling equipment has been made by the Insley Mfg. Corp., Indianapolis, Ind. A branch store is at 927 15th St. N. W., Washington, D. C.

Galion Allsteel Appoints Dealer

The new Minnesota distributor for Galion Allsteel dump bodies and hydraulic hoists, manufactured by the Galion Allsteel Body Co., Galion, Ohio, is the Truck Hoist & Equipment Co., Minneapolis. The dealer will stock a full line of Galion Allsteel bodies, hoists, and Load-evator hydraulic end loaders.

Located at 1409 Second St. S., Minneapolis, the distributor also will offer modern body and hoist installation facilities, as well as a complete parts and maintenance service.

New Omaha Standard Dealers

Handling the center-dump trailers made by Omaha Standard Body Co., Council Bluffs, Iowa, are: Cramer Machinery Co., 1005 E. Stark St., Portland, Oreg.; Pecaut Equipment Co., 900 E. Eighth St., Sioux Falls, S. Dak.; Border Machinery Co., 1710 Paisano Drive, El Paso, Texas; The Lang Co., First S. and Second W., Salt Lake City, Utah; Tri-State Equipment Co., E. 320 Trent Ave., Spokane, Wash.; and Brake Equipment Co., 5225 W. State St., Milwaukee, Wis.

Page Names New Iowa Dealer

Spreitzer, Inc., U. S. 30 W., Cedar Rapids, Iowa, is a new distributor for Page Automatic dragline buckets, chains, and accessories manufactured by the Page Engineering Co., Chicago, Ill., to cover eastern half of Iowa.

RENOVATES and RESTORES TURF

On Highways with Grass Islands!

This new *Renovataire* has giant 22″ wheels with saw toothed curved knives that slice and penetrate turf up to 4″ in depth. Gets air, water, and fertilizer down to the roots, opens up and renovates sod-bound highway turf. Hydraulic lift frame transports itself.

For Healthy Turf—Renovate!

SOILAIRE INDUSTRIES Minneapolis 3, Minnesota

Soil Aerating Machines—Power Rollers

Used by over 1500 institutions

More And More Manufacturers Are Installing MARVEL SYNCLINAL FILTERS AS STANDARD EQUIPMENT

Manufacturers of hydraulically actuated equipment and others with low pressure liquid circulating systems demand their equipment to perform consistently with all the productive efficiency they build into the machine that bears their name. Since these systems must be kept free of damaging particles, the selection of a filter is an important factor. Here are some of the outstanding reasons for the increasing preference for Marvel Synclinal Filters to do this all-important job!

SUMP TYPE (Cutaway)

BECAUSE . . . Marvels are designed to give maximum ACTIVE filtering area rather than total filtering area. Only ACTIVE FILTERING AREA COUNTS!

BECAUSE . . . Marvels greater storage space for filtered out particles allows longer periods of "production" time at absolute minimum in maintenance cost and "down-time".

BECAUSE . . . Marvels can be disassembled, cleaned and reassembled by any workman in a matter of minutes. Line type may be serviced without disturbing pipe connections.

BECAUSE . . . Marvels are protected and of sound construction to give long life and efficient filtration.

BECAUSE . . . Marvels (Both Sump and Line Type) are available in individual capacities from 5 to 100 G.P.M. and choice of mesh sizes ranging from coarse 30 to fine 200, they get a filter to fit their specific requirements.

BECAUSE . . . Marvel not only delivers a top grade filter in both quality and performance, but delivers IMMEDIATELY—shipments are made the same day orders are received, if desired.

LINE TYPE (Cutaway)

FACTS — NOT CLAIMS

Engineers decide on the basis of the record, on the basis of measurable facts rather than claims of the "campaign promise" variety. Here is a fact with meaning:

→ OVER 500 MANUFACTURERS MAKE MARVEL SYNCLINAL FILTERS THEIR O.E.M. CHOICE

WATER FILTERS

Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

FILTERS FOR NON-FLAMMABLE HYDRAULIC FLUIDS

Marvels most recent development is a filter for the efficient filtration of all types of non-flammable hydraulic fluids.

Catalogs containing complete data available on request

MARVEL ENGINEERING COMPANY
625 W. Jackson Blvd., Chicago 6, Ill.
Phone — Franklin 2-4431

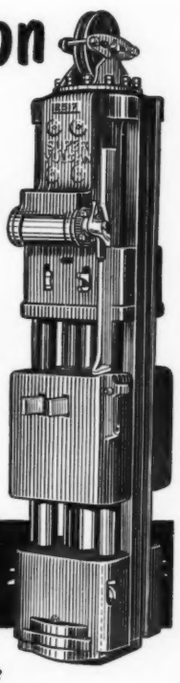
CE-11

Without obligation, please send me complete data on Marvel Synclinal Filters, as follows:—
☐ Catalog #106—For Hydraulic Oils, Coolants and Lubricants
☐ Catalog #300—For WATER
☐ Data on filters for Non-flammable hydraulic fluids.

Name .....
Title .....
Company .....
Address .....
City .....
State .....

Greater Penetration Per Blow

SUPER VULCAN DIFFERENTIAL ACTING PILE HAMMERS



Rugged strength, simple design, positive action. Delivers twice the usual number of blows per minute with 25 to 35 per cent less steam per blow.

WRITE TODAY FOR COMPLETE DETAILS AND NAME OF NEAREST DEALER

VULCAN IRON WORKS

Manufacturers of Pile Driving Hammers and Pile Extractors Since 1852

VULCAN IRON WORKS • 329 NORTH BELL AVENUE • CHICAGO 12, ILL.

A hydraulic ram raises or lowers the digging wheel on the new Model 150 Trenchliner to maintain close grade tolerance. ►

Track-Mounted Ladder-Type Trenching Machine Features Hydraulic Digging-Wheel Control

■ Hydraulic control of the digging wheel is an important feature of the new Model 150 wheel-type Trenchliner developed by the Parsons Co., Box 431, Newton, Iowa. The digging wheel is moved up and down a vertical mast by a hydraulic ram holding close grade tolerance at any depth. The mast is also power controlled. A separate hydraulic ram tilts it to carry the weight of the wheel foward on the machine for proper balance when traveling, loading, or unloading on trucks or trailers.

The new Trenchliner produces from 12 inches to 25 linear feet of trench per minute. With a digging capacity of 5¾ feet deep and 16 to 26 inches wide, it meets requirements for drainage work, pipeline installations, irrigation projects, general utility, and construction work. The Model 150 has 30 digging feeds, and three speeds on the heavy-duty digging wheel up to 11.25 rpm.

Among other features incorporated in the new 150 Trenchliner are: a shiftable and reversible belt conveyor that discharges spoil to either side; a dual-purpose friction-type clutch on the digging wheel drive that protects machinery against shock loads; and solid or tine-back buckets with gumbo lips or tap-in-type teeth.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 558.

Same wages . . . 12 to 15 yards more concrete

With this Jaeger 3½S Auto-Loader you load while you mix and measure as you load. The power shaker action of its hopper charges the drum in a flash the instant you open the gate. Dual-mix drum, with extra big bucket and flight blades, insures thorough mixing and discharges faster. Machined steel drum tracks and rugged construction thruout for long service.

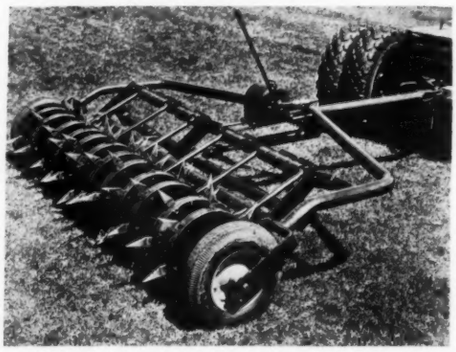
3½S Tilter
Also 6S, 11S and 16S Power Loaders

THE JAEGER MACHINE COMPANY 701 Dublin Avenue Columbus 16, Ohio

Sales, Rentals and Service in 154 Cities of United States and Canada

PUMPS • COMPRESSORS • HOIST TOWERS • LOADERS

Soil-Aerating Device Renovates Roadsides



The Renovataire, introduced by Soilaire Industries of Minneapolis, slices through soil to condition turf.

■ A new towed machine, designed to both aerate and renovate roadsides, is now being built by Soilaire Industries, 1208 Second Ave. S., Minneapolis, Minn. The Renovataire is used to recondition worn-out, compacted, and eroded roadside slopes, parkways, grass islands, or newly seeded areas. It helps to bring air, moisture, and fertilizer down to the root zones.

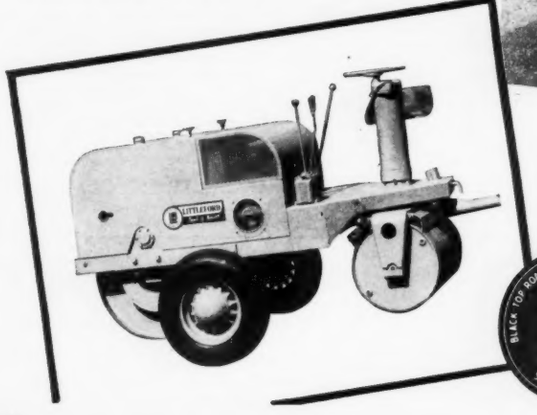
The machine runs on 22-inch wheels, built in pairs and individually suspended from the drawbar. This mounting provides a free-floating differential action that will follow any ground contour at speeds up to 5 mph or more. A hydraulic lift frame is provided for towing the unit on highways.

Saw-toothed knives, adjustable from 2 to 4 inches in depth, penetrate the soil with a slicing action and make 2-inch slits. There is no surface disturbance, and a minor amount of soil is extracted.

For further information write to the company, or use the Request Card at page 18. Circle No. 613.

CUT YOUR LABOR COSTS WITH A MODEL 157 LITTLEFORD TRAIL-O-ROLLER

Engineered to cut operating costs, this modern 2 to 3 ton Portable Trail-O-Roller will roll patches on Highways, Roads, Streets, will roll Parking Lots, Driveways, Airport Runways or wherever compaction is needed. The model 157 is a workhorse for Contractors, Highway and Park Departments, Cities and Counties. Its portability and the ease of changing from trailing to rolling or rolling to trailing makes it the most desired piece of equipment. It can be trailed on its own wheels at any speed—compaction ranges from 75 to 160 lbs. This modern highly Portable self-propelled Roller is the answer to all rolling problems, with money-saving features that will cut operating expense to a minimum.



Equipment with this seal is your assurance of an Equipment unit to do the job.

Equipment with BUILT-IN ENGINEERING LITTLEFORD

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE 1900

LB LITTLEFORD

LITTLEFORD BROS., INC.
485 E. Pearl St., Cincinnati 2, Ohio

FOR SALE

8" & 12" PIPE

For Medium Pressure Pipeline Service—Road Crossings—Piling and Structural Purposes.

200,000' 8⅝" O.D.
.322 Wall—28.55# Lapweld

100,000' 12¾" O.D.
.375 Wall—49.56# Lapweld

All machine cleaned, commercially straight, 20' single random lengths, ends beveled, used good condition. Priced low, prompt shipment, Welda, Kansas, Grandview and Carrollton, Mo.

Write, Wire, Phone

Humboldt - Chicago

PIPELINE PROJECT

125 W. 3rd St. Tulsa, Okla.

Phones 2-9128 — 54-4229

The new ¾-yard Link-Belt LS-68 excavator.

New 3/4-Yard Machine In Light Shovel Field

■ A light ¾-yard shovel-crane, the LS-68, is announced by Link-Belt Speeder Corp., Cedar Rapids, Iowa. The new machine takes the place of the LS-52, which has been in the field since 1952. The LS-68 features the Speed-o-Matic power hydraulic controls and several more recent advances.

Important features include a heavy wide lower frame that measures 11 feet over-all and is 9 feet 2 inches wide with 24-inch shoes and 9 feet 8 inches wide with 30-inch shoes. Ten-inch-diameter heat-treated forged-steel single-flange track rollers are bronze-bushed and mounted on 2½-inch-diameter shafts.

Maximum ground-bearing area with the standard lower frame is 47 square feet. A long-wide frame is also available, on which 36-inch shoes can be used to increase this contact area to 63 square feet.

The weight of the LS-68 machine is 35,300 pounds as a standard shovel. Separated drum gears and clutch shells permit the use of alloy cast-iron clutch shells. Six conical hook-rollers—two equalized pairs in front and two individually mounted in the rear—are standard equipment.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 585.

Wayne Crane Division Names New Sales Manager

The Wayne Crane Division of American Steel Dredge Co., Inc., Fort Wayne, Ind., has appointed Felix Sweeney sales manager of the division.

Mr. Sweeney, formerly eastern district sales representative, will make his headquarters in Fort Wayne.

Booklet Lists Conveyors And Bucket Elevators

■ Conveyors of all types, bucket elevators, and feeders are described and illustrated in a new catalog from Bonded Scale & Machine Co., 2176 S. 3rd St., Columbus 7, Ohio. The booklet covers idler conveyors, pulleys, idlers, takeups, and other parts. It also includes a full range of flight conveyors, belt and chain-type bucket elevators, and feeders.

Bonded idlers, rollers, pulleys, and transmission equipment are interchangeable with all other standard makes. The new catalog describes, as well, many of the custom-built conveyors which have been produced by the company.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 595.

everything you need for easy soil sampling

1. **portable** Carry it in your car.
2. **easy to use** No experience needed to operate.
3. **dependable** Recovers accurate, undisturbed samples.

the ACKER SOIL SAMPLING KIT

More than 30 years of soil sampling experience all over the world has proven that this kit is the most versatile, portable collection of soil sampling tools you can buy!

LOW COST — NOTHING TO GET OUT OF ORDER —

WRITE TODAY FOR PRICES AND BULLETIN 30, C&E

ACKER DRILL CO., Inc. 725 W. Lackawanna Avenue Scranton, Penna.

TESTING SERVICE CORP.

TESTING ENGINEERS
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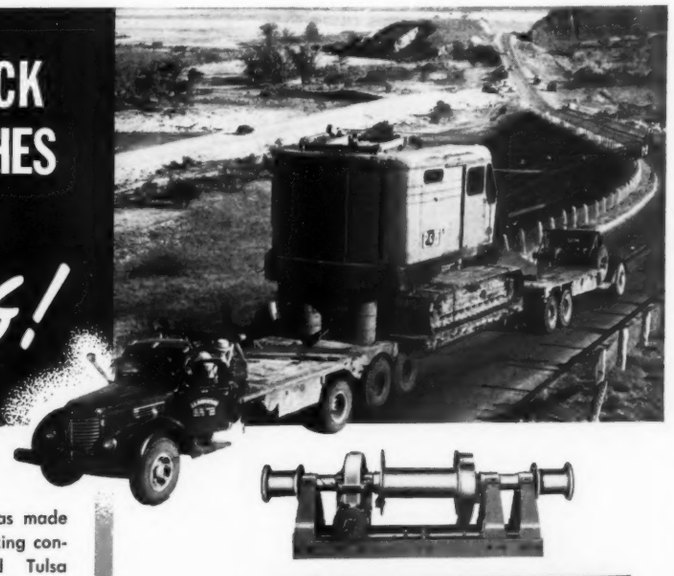
Foundation Investigations — Laboratory Analyses and Evaluation of Construction Materials — Soil Mechanics, Concrete and Asphalt Technology. Field Inspection and Consultation.

Special Investigations for Dams, Turnpikes and Airports.

710 North Brookfield, South Bend 28, Ind.

TULSA* TRUCK POWER WINCHES *for HAULING!*



Movement of this power shovel was made easily and quickly by a Texas trucking contractor with two truck-mounted Tulsa Winches. This is just another example of the versatility and reliability of Tulsa Winch. There is a Tulsa Winch for every make and model of truck and crawler tractor.

Tulsa* Winch
TULSA, OKLAHOMA DIVISION OF VICKERS Inc.

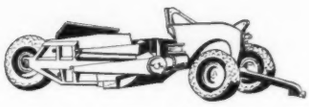
*Reg. U. S. Pat. Off.

Coming in your December issue of Contractors & Engineers FOUR feature articles on THE OHIO TURNPIKE

plus articles on other types of heavy construction work and the usual coverage of new products.

Don't miss it!

EXCAVATING EQUIPMENT



Hauling Units

SCRAPERS, known also as carrying scrapers, pans, or cans, and by various trade names, are digging and grading machines which carry or drag their loads behind the prime mover. They have a very wide range of types and capacities; sizes vary from ¼-yard hand scrapers to self-powered machines carrying 30 yards or more. They may be towed behind crawler or wheel tractors, or driven; may have two axles, one, or none; may dump underneath or to the rear; and use cable, hydraulic, or hand controls.

The bottom-dump two-axle machines are of primary importance in earthmoving. They are the standard tool for alternating cuts and fills, under the wide range of conditions where soil is firm enough to support them and is fine and soft enough for them to handle, or can be made so by rooters or explosives.

The scraper can dig, haul, and spread in a single normal working cycle. It can work alone if necessary, but production is usually increased if it is assisted by other machines. It works in thin layers both in the cut and on the dump, without limit as to the number of layers, so that its efficiency is not particularly affected by depth of cut or height of fill. Its use causes considerable compaction of fills and favors proper use of rollers.

In various models, its economical haul distance ranges from less than 200 feet to a mile or more. Where conditions are favorable, it can move earth at lower cost per cubic yard than can any other type of earthmover now available.

It is not only an excellent machine for bulk earthmoving, but a precision finishing tool as well. The cutting edge is carried between front and rear wheels so that it is unaffected by pitching, and the operator can control its position very accurately. If job conditions give him time, he can cut or fill accurately to grade; and when space permits maneuvering, can build crowns and slopes as well.

Two Main Types

There are two basic types in use: a full trailer model, which is towed and controlled by a separate tractor, usually of the crawler variety, and a self-powered model, in which the prime mover is a wheel tractor more or less permanently fastened to the scraper. This tractor may be the two-wheel type or may have a pair of front wheels as well.

Crawler-powered scrapers have maximum digging power. Wheel-powered units usually need help from a pusher tractor to get full loads, but are much faster on the haul and can be profitably used on longer runs.

The scraper has three basic operat-

DON'T LET OLD MAN WINTER SLIP UP ON YOU!

. . . . . GET REAL CONTROL OF ICE CONTROL!
PUT HI-WAY SPREADING EQUIPMENT TO WORK

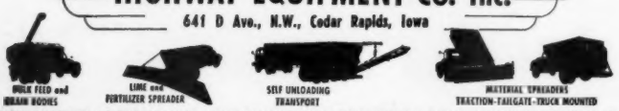
HERE'S THE "DUAL POWER" MODEL E—THE NEW LEADER IN MATERIAL SPREADERS GIVES YOU:

- A metered spread
- Adjustable width of spread 3' to 70
- Forward or reverse spreading without shifting
- Cab controlled operation
- Spreading at speeds up to 35 MPH
- Conveyor output controlled by positive truck drive shaft drive
- Distributor Disc driven hydraulically
- Accurate spreading of salt, sand, cinders, calcium chloride

HI-WAY MODEL DD—an all-season, low-cost portable tail gate spreader mounts on standard dump body, powered by rugged gas engine.

Get more information on the complete *New Leader line* of spreaders. There's a size for every need as well as gas engine or power take off driven models.

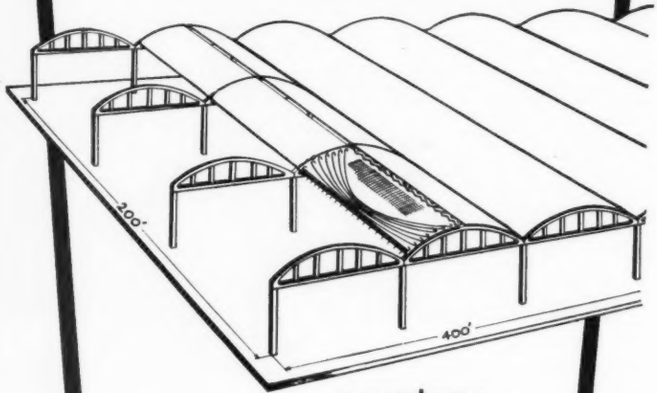
HIGHWAY EQUIPMENT CO. Inc.
641 D Ave., N.W., Cedar Rapids, Iowa


BULK FEED and GRAIN BODIES
LIME and FERTILIZER SPREADER
SELF UNLOADING TRANSPORT
MATERIAL SPREADERS TRACTION-TAILGATE-TRUCK MOUNTED

MANUFACTURER OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS AND BULK DELIVERY EQUIPMENT.

SAVE NEARLY HALF
THE MATERIAL & LABOR

Specify the precast
ORTEGA-BILLNER ROOF



- warehouses
- factories
- low cost housing

VACUUM CONCRETE, INC.
4210 Sansom Street • Philadelphia 4, Pa.

This is the sixth in a series of articles made up of excerpts from a new book, "How To Operate Excavation Equipment," by Herbert L. Nichols, Jr., published by North Castle Books, Dept. N, 212 Bedford Road, Greenwich, Conn. Priced at $2.50 for cloth and $3 for deluxe leatherette binding, the book may be obtained from the publisher or through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 4th Ave., New York 16, N. Y.

ing parts. The bowl, the load-carrying part of the body, is equipped with a cutting edge on the front of the bottom and can be raised and lowered. The apron is the front wall of the bowl and can be raised and lowered independently of it. The tailgate, or ejector, may be the rear wall of the bowl which is moved back to make room for a load, and forward to discharge it. In other models, it is the floor and rear wall of the bowl, and is tilted up and forward to dump.

Control is usually by means of two winches mounted on the tractor, but three winches on either the tractor or the scraper may be used. Hydraulic controls are also available for small and medium-size machines. In two-winch and in some hydraulic models, the apron and tailgate are operated by a single lever through linkage arranged so that the apron opens before the tailgate moves forward, and the tailgate moves back before the apron closes.

Scrapers are efficient at penetrating fairly hard soils, as the cutting edge is sharp and held at an effective angle. The machine cannot be overbalanced by suction, as the knife is carried between the axles; but a plastic soil may pull the edge a few inches deeper than intended by flexing the tires or causing them to sink into the ground.

There are hardpans and rocky soils which the knife will not cut, and many others which can be dug only by the expenditure of so much power in penetrating that little force is left for the loading. In such cases, the use of ripping machines or explosives ahead of the pans is advisable. Scarifying costs can often be reduced and loading benefited by using widely spaced teeth, so that the ground will be coarsely broken rather than pulverized.

Except when using a tractor which is oversize for its scraper, and when loading down steep slopes or in exceptional material, pushing a scraper with another tractor greatly increases the size of the load.

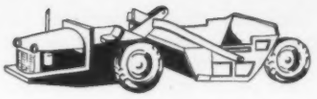
Most pushers are crawler tractors, although there is increasing use of rubber-tire four-wheel-drive machines. Because of their greater speed, these can service a larger number of scrapers under average conditions. However, they ordinarily do not exert as heavy a push, and their usefulness declines rapidly if the cut becomes slippery.

Scrapers can also load each other. Transporting a scraper, whether full or empty, takes only a fraction of the power required to pick up a load. A prime mover with a scraper attached can therefore give a powerful boost to another unit either before or after it picks up its own load.

Pushing Train

A bumper may be put on the back of a pusher tractor so that another tractor can get behind it to help with the pushing.

The pusher tractor is often dozer equipped and can do rough grading and odd jobs between scrapers. It is good practice to reinforce the center of the blade, either internally or with a pusher cup on the surface, to prevent caving in the moldboard with repeated maximum strain and shock in the center.



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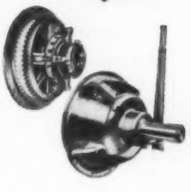

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which are rigidly attached to the frame of the tractor and which cannot be moved up or down except by hand adjustments. These are much cheaper, but may cause difficulty in lining up with bumpers on different makes of scrapers and may be difficult to keep in contact during pitching caused by very rough ground or changes in torque.

Although both track and wheel tractors can drag loaded scrapers successfully over soft and rough ground, they operate slowly and with increased maintenance requirements. Yardage, both in the load and in the number of loads, can be greatly increased by providing a smooth hard surface for rubber-tire tractors and a smooth slightly soft surface for track types. If a very large quantity is to be hauled on rubber, it should pay to oil or blacktop the road.

Work Pattern

Use of an efficient work pattern is important in obtaining maximum production. Such patterns are sometimes dictated by the job layout with little opportunity for change, but at other times the work can be done in several different ways.

If a mixed lot of machinery is available, it is helpful to assign each unit to a length of haul and type of work suitable to it. In general, the dozer does short-push work, the crawler-drawn scraper the medium hauls, and the rubber-drawn scraper, the long trips. These statements are for average conditions and will not hold for all jobs, as the use of oversize pans or the necessity of traveling on very soft footing and up steep grades give the crawler rigs an advantage even on fairly long hauls, while ideal loading and haul conditions will give wheel tractors an edge.

However, great savings may be affected if the fast machines on rubber can be kept on long hauls, the crawler ones on short hauls, and the dozers kept on trail-breaking, reduction of very short rises, and cleanup work. This, however, will involve continuous operation of at least two cuts and one fill, or one cut and two fills, unless a fill is long enough so that the long-range machines can do the far half and the crawlers the near section.

If two cuts are available, but only one pusher, the crawlers can self-load at the nearest fill and the pusher can help rigs at the further cut.

In many cases, the savings of such division would be outweighed by the extra supervision and traffic difficulties involved.

Savings may be effected by reducing the time loss in turns. A scraper of any kind may take from ten to sixty seconds to turn around. The fastest turns are made without a load when the space is wide enough for an open swing and flat enough so that tipping over is not a problem.

Another time loss in turns is the distance which must be traveled beyond the completion of the dump, or past the loading spot, to reach the turn. This loss is often increased unnecessarily by careless dumping or loading, which leaves the fill or cut too rough for a turn, or by placing too many grade stakes to permit turning in the work area.

Even if the turn is efficiently handled, it is a dead spot and on a short haul may take a substantial part of the cycle time. When a succession of cuts and fills is to be made, it may be possible to increase production by reducing the number of turns.

Turn patterns are, of course, subject to the over-all plan for the job, which may include some very complex factors of distribution, work sequence, and separation of different types of soil. However, an alert supervisor can usually effect an increase in production by seeing to it that turns are kept to a minimum and that adequate space, as close to the work as possible, is provided for those which must be made.

When a pan loads, it pushes some dirt in front of it, more in loose or sandy soils than in heavy ones. This pushed heap may be used to build up fill areas which are at the edge of a cut.

The scraper is often dependent on other equipment, particularly on dozers and rooters, to prepare an area so that it can work it. Ordinarily, the towing tractor is not dozer equipped, or the dozer is useless because the control winches are used for the scraper. If the dozer is usable, a crawler is still greatly handicapped by the attached trailer, as it cannot be backed more than a few feet without the most delicate manipulation.

Wheel tractors with the semitrailer type of scraper can maneuver freely but do not have the traction for heavy dozer work.

Lacking a dozer, the tractor is compelled to walk on the original grade —which may be dangerously steep, rough, or overgrown—and try to manipulate the scraper behind it at the same time.

Scrapers are not designed for moving boulders and stumps, which can usually be handled more economically by dozers or rooters. Some makes will stand up well under this type of work, while others may give trouble with bending and breaking of parts.

Dump Trucks

Driving a dump truck is somewhat like driving a car. However, the truck is much heavier and more bulky, has very poor visibility to the rear, and usually requires special methods of shifting gears and climbing and descending hills.

In addition, checking the truck, spotting it to the load and dump, and operation of the body are special techniques not related to any experience gained in driving a car.

It is particularly important that tire inflation and condition be checked at least daily, as the tires

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are the most vulnerable and most expensive wearing parts of a truck. Running them soft with a load may ruin them in a few minutes.

If the truck has air brakes, it should not be moved until the dash gage shows safe operating pressure.

Direction signals and stop lights must be in working condition for driving on highways or on heavily traveled haul roads.

Stones stuck between dual tires should be removed immediately as they may be thrown behind the truck with deadly effect. A stone can usually be pried out with a bar or board, but it is occasionally necessary to let the air out of one tire to free it.

Each load should be checked for rocks or other objects which might fall off. These may be moved to safer positions or be pushed off in the pit.

Truck drivers may add substantially to shovel production by getting promptly in proper position. If a spotter is present or the shovel operator is giving signals, directions should be followed exactly, regardless of the driver's ideas of where the truck should be. If a spot log is used, the rear wheels should be backed squarely against it.

If the shovel has not moved, a truck will generally be spotted in the same place as the last one loaded. Following tire tracks or observing the location of spilled material makes it easy to get in the same position.

In general, a truck hauling from a revolving shovel is placed to require the shortest practical swing from the digging. It should be facing directly away from the shovel so that the shovel can reach from back to front of the body by use of the crowd mechanism, or at a right angle so that the swing controls can be used to distribute the spoil along the length of the body.

Driving a semitrailer resembles ordinary truck driving in a general way, but special precautions must be taken in steering and stopping, and particularly in backing.

Very sharp turns may be made in proportion to the length of the whole unit, particularly when the tractor is a short-coupled off-the-road type and the trailer yoke is high enough to allow space for the tractor rear tires under it. However, turns must be made carefully to avoid overrunning and jackknifing.

In general, full trailers should not be used where backing is required. Emergency measures for getting one out of a blind street include unhooking so as to tow it backward.

(TO BE CONTINUED NEXT MONTH)

Booklet Offers Study Of Cellular Concretes

The properties and methods of preparing cellular concretes of various types are treated in "Cellular Concretes," a reprint in handy booklet form of a paper given at the annual convention of the American Concrete Institute last February at Denver, Colo. The paper is by Rudolph C. Valore, Jr., materials engineer with the National Bureau of Standards.

Considering concretes weighing from 10 to 100 pounds per cubic foot and having a homogeneous void or cell structure as cellular concretes, the paper reviews methods of preparation and physical properties of moist and high-pressure steam-cured cellular concretes as they have evolved in Europe. Experimental mixtures prepared by the National Bureau of Standards of this country also are discussed. Ingredients, strength, shrinkage, water absorption, elasticity, thermal expansion, fire resistance, etc., are treated.

Copies of "Cellular Concretes" may be ordered, at $1 each, from the American Concrete Institute, 18263 W. McNichols Road, Detroit 19, Mich.

Two-Way Phones Powered By the Speaker's Voice

■ Two-way communication that doesn't require a power source—not even a battery—is offered in the telephone equipment made by The Wheeler Insulated Wire Co., Inc., Waterbury 91, Conn. Power to operate these telephone sets comes from the speaker's voice.

Because they are sound-powered, the sets use no auxiliary equipment. They are therefore particularly suitable for jobs that need a portable or temporary means of communication.

According to literature from the manufacturer, telephone hand sets of this type will give satisfactory operation over 25 miles with No. 16 twisted wire, or up to 15 miles using No. 19 wire. The line allows more complex communications systems, too, including multi-unit intercom systems.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 569.

Steel in Construction

■ A recent issue of the *Bethlehem Review* covers the Bethlehem Steel Company's contribution to the construction industry over almost half a century. The diversified subject matter includes photographs and text detailing the construction use of a wide range of products made by the company.

To obtain this literature write to the Bethlehem Steel Co., Department of Publications, Bethlehem, Pa., or use the Request Card at page 18. Circle No. 674.

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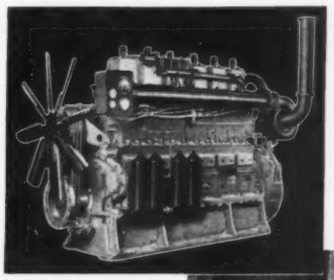
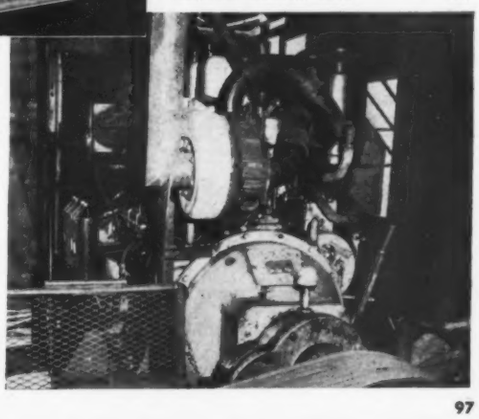
turbocharged WAUKESHA Diesels



Mr. William E. Crum, President, Penbrook Contracting Corp. says: "One of the best engines we have ever owned." Outstanding characteristics of this big turbocharged Waukesha LRDBS Diesel are lively acceleration, clean burning, prompt starting, a tremendous reserve of power and great overall economy. Send for Bulletin 1606. 259

Turbo-Supercharged Waukesha LRDBS Diesel *(above and right)*—2894 cu. in., 8½-in. bore and stroke; develops 570 hp max. at 1200 rpm; burns all standard "high speed fuels"—powers drag line *(top)* owned by Penbrook Contracting Corp.



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Chemical Solidification Of Subsurface Soil

■ Literature available on request describes a method of strengthening settling foundations by solidifying the soil in place and without excavation. Fluid conditions around piers and piling can also be controlled by this method, which also has applications in highway, tunnel, and dam construction.

The process is the Manu-Mine soil solidification system that involves the injection of one or two chemical solutions into the soil. These precipitate into a silica-gel which penetrates into the strata to form a sandstone-like mass impervious to water. Each application of soil solidification is specially engineered by the company, with careful analysis conducted first in the field and laboratory on representative soil samples.

To obtain this literature write to the Manu-Mine Research & Development Co., P. O. Box 167, Reading, Pa., or use the Request Card at page 18. Circle No. 636.

High-Tensile Steel Bolts For Structural Joints

■ The use of high-tensile steel bolts in structural-steel construction is covered in some detail in a booklet from the Lamson & Sessions Co., 1971 W. 85th St., Cleveland 2, Ohio. The literature explains the advantages of high-strength bolting over riveting in structural steel work.

Sections cover the mechanical principles involved in bolted joints, the design and fabrication of these joints, and specifications for their assembly. Instructions for ordering are included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 559.

With a quickly-interchangeable snowplow attachment, the Prime-Mover power wheelbarrows can be assigned to snow clearing. The buckets can be filled with sand to be spread on icy walks or drives.

Powered Wheelbarrow Has Snowplow Blade

■ The ¾-ton Prime-Mover powered wheelbarrow features among its accessories a snowplow attachment. The 50-inch angling blade is easily installed and can be readily dropped off to permit the powered wheelbarrow to resume its normal material-handling operations.

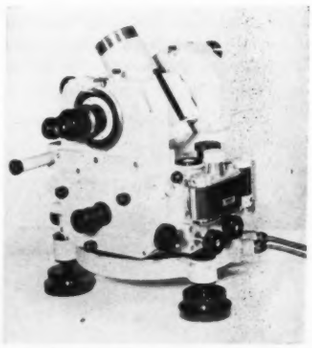
While the blade is being used, the 10-cubic-foot bucket can be filled with ballast or sand for spreading on icy walks and drives. The manufacturer points out that because the blade attachment, bucket, and platforms are quickly interchangeable, the Prime-Mover changes over from one job to another with no lost time, and eliminates the cost of special equipment.

For further information write to the Prime-Mover Co., Sampson St., Muscatine, Iowa, or use the Request Card at page 18. Circle No. 531.

Imported Theodolite Has Built-In Camera That Records Observations on Strip of Film

■ A newly imported surveying instrument, the Gigas precision theodolite, is equipped with a miniature robot camera that produces a photographic record of both circles as well as the cross level and clock. The data obtained on each record includes that part of the azimuth and elevation circle that is in the field of view; an image of the plate or alidade level, free from parallax, at the exact moment of observation; and a time indication of the moment at which the exposure was made. Also, the observer can make a hand-written notation on the film to identify the station.

For evaluating the film later, the theodolite micrometer is used. It can be removed from the instrument and mounted in a stand to facilitate reading the film.



The Gigas precision theodolite features a built-in 35mm camera that photographs readings.

The Gigas theodolite is being imported into this country from the western sector of Berlin, where it is made by Askania Werke, A. G. The Geo-Optic Co., 170 Broadway, New York 38, New York, is the importer.

For further information write to the Geo-Optic Co., Inc., or use the Request Card at page 18. Circle No. 666.

Wright Names Waldie

The Wright Power Saw & Tool Corp., Stratford, Conn., has appointed Arthur Waldie district manager in charge of sales in 11 western states and the Canadian provinces of British Columbia and Alberta.

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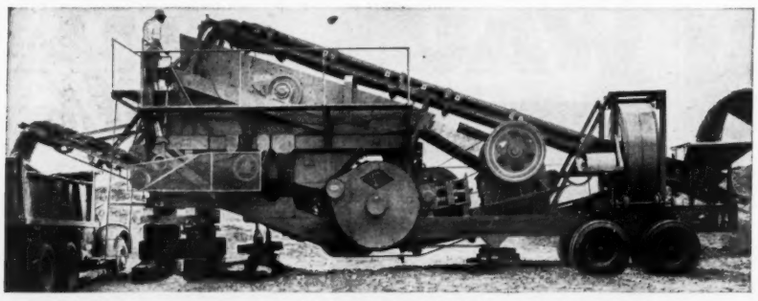

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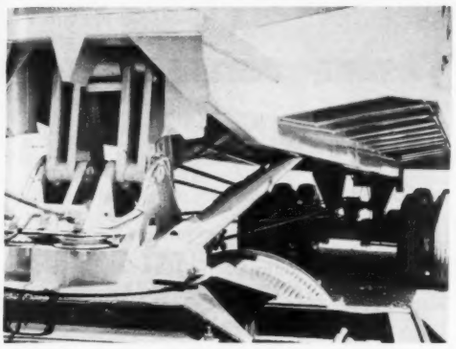
Cam-Lift Booster for Cable-Dump Trailers Opens Way for Longer, Heavier Models



Under this Hobbs Schonrock cable-dump tractor can be seen the new cam-lift booster fifth wheel that helps lift the trailer body at the beginning of the dump cycle.

■ The Schonrock cable-dump trailers made by Hobbs Mfg. Co., 609–623 N. Main St., Fort Worth 1, Texas, can now be produced in longer and stronger models as a result of improvements in the dumping mechanism. The company now builds these cable-dump units with a cam-lift booster on top of the fifth wheel.

This rotating cam-lever-sheave device raises and supports the front end of the trailer during the first 10 percent of the dump cycle, when the greatest inertia forces must be overcome and when the lifting arms are at the most disadvantageous angle. Because the booster cuts the initial cable line pull by something like 75 per cent, the dead weight of the trailer now imposes much less of a limitation on the maximum size of the trailer than before. At the same time, the booster eliminates frame strain, cuts down the engine torque required to raise the trailer, and allows cable tension to build up gradually, making for a smoother safer dump.

Other improvements in the Hobbs Schonrock cable-dump trailers include a strengthened frame and side-rail construction. A semiautomatic cutaway fifth wheel allows easy disconnecting and re-engaging of the trailer. A cable-releasing attachment for disconnecting the trailer completely and an adapter on the fifth wheel that makes it possible to switch to a standard trailer are also recent innovations in this line.

When the cable-dump trailers are used to haul light materials, special sidewall extensions can be used to increase volume capacity. Also available is a hot-mix spreader and removable batch gate attachment for work with concrete paving machines.

For further information write to the company, or use the Request Card that is bound in at page 18 of this issue. Circle No. 612.

Overhead Loader Changes Quickly From Bucket to Bulldozer Operation

■ Instant changeover from bulldozer to bucket operation and back is featured in the Strait-Line 88 hydraulic loader. A lever within the reach of the operator makes the conversion. The Strait-Line 88 is an overhead loader built around the Oliver 88 wheel tractor by Maine Steel, Inc., 169 Front St., South Portland, Maine.

The bucket digs to the rear and ahead of the tractor. With the bucket loading to the rear, there is 3⅓ times as much weight on the rear wheels as on the front to provide improved traction and steering. Digging is also aided by a crowding feature that pushes the cutting edge of the bucket 7 inches into a bank after the tractor has stopped.

A variety of buckets are available for the machine, including a ¾-yard impact bucket, a 1-yard loose-material bucket, a 1½-yard light-material bucket, a 1¼-yard window bucket, and a 2-yard snow bucket. The bulldozer blade for the loader is 8 feet 1 inch in length, and angles to either side. Also available is a double-end crane with load-spotting arms.

For further information write to the company, or use the Request Card at page 18. Circle No. 608.

Alhough this Strait-Line 88 loader is loading a truck, the bulldozer blade has been left attached. The operator can change to backfilling instantly by pushing a small lever.

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SHOVEL-CRANE REPORT ON THE OHIO TURNPIKE

Sub-contractor Al Johnson Construction Co., Minneapolis, Minnesota, uses a 30-ton Lorain Moto-Crane, model MC-524, on their contract to dig footings for the 154 ft. Black River Bridge in Elyria. All in all, they have purchased seven Lorains.

MORE THAN 50 LORAINS SO FAR
ON ALL PHASES OF CONSTRUCTION

A Lorain took the first bite of earth at the ground-breaking ceremonies for the Ohio Turnpike. Since then, more than 50 additional Lorains have gone to work to rush completion of this vast 241-mile superhighway by October, 1955. Lorains of all sizes and types—shovels, cranes, clamshells, draglines, hoes—on rubber-tires and crawlers (up to 61 tons capacity)—are fitting the needs of a long list of big-name contractors on this big job. In the rubber-tire class alone, Lorain Moto-Cranes outnumber all other makes combined.

Your jobs may not be Turnpikes, but you, too, can profit by the same Lorain advantages so well known to men that must beat the *big* deadlines at a profit. See your nearby Thew-Lorain Distributor now . . . learn all the reasons why a Lorain is your best buy.

▲ More than 25 rubber-tire Lorain Moto-Cranes speed up and down the right-of-way to get work done. Sub-contractor Vogt & Conant, Cleveland, Ohio, 10-time Lorain owner, uses a 20-ton Lorain Moto-Crane to set 15-ton, 60 ft. long steel girders for this overpass. In the background, a 22½-ton, model MC-424 Moto-Crane, owned by Peter Kiewit Sons Co., uses a 1-yd. concrete bucket to pour abutments. Kiewit has purchased 36 Lorains.

A Lorain-820 Shovel, equipped with 2½-yd. dipper, is shown below digging a rock cut on another section of the Ohio Turnpike. ▼

◀ A Lorain crawler dragline handles ditch excavation as part of important drainage construction along 241-mile road.

Harrison Construction Co., Pittsburgh, Pennsylvania, have purchased a total of 55 Lorains. Below, one of their 1-yd. Lorain-50 Hoes digs a trench for a 36″ corrugated cross-drain on one of their three contracts that total $9 million. ▼

OHIO TURNPIKE FACTS AND FIGURES

Estimated quantities:

Earth and rock excavation	29,500,000 cu. yd.
Fill or borrow	46,900,000 cu. yd.
Pavement concrete	7,860,000 sq. yd.
Bituminous shoulder surfacing	5,200,000 sq. yd.
Concrete in structures	582,000 cu. yd.
Steel	171,000 tons

STRUCTURES:

Bridges, drainage, overpasses, etc. 612

THE THEW SHOVEL CO
Lorain, Ohio
THEW
LORAIN

MANUFACTURER MEMOS

Product Sales Manager Is Named by Gar Wood

B. F. Whitbread has been appointed product sales manager for the hydraulic hoists and dump bodies manufactured by Gar Wood Industries, Inc., Wayne, Mich. In his new position, Mr. Whitbread will be responsible for sales of the new line of equipment recently introduced by the company.

With Gar Wood for almost 20 years, Mr. Whitbread has been manager of the direct factory truck equipment sales branch in Los Angeles since 1950. Prior to that, he served the company as service manager and staff assistant in sales.

At the same time, H. H. Hippler was named assistant director of sales and service administration for the company. He will be responsible for sales administration and service functions.

The new sales manager of St. Paul Hydraulic Hoist division of Gar Wood, Mattoon, Ill., is Ross Miller. Formerly vice president and general manager of National Lift Co., he has been in the truck equipment field for more than 35 years.

District Managers Named By Lincoln Electric Co.

New district managers for The Lincoln Electric Co., Cleveland, Ohio, are Robert J. Hirsch and Richard P. Lindgren, who will head the North Haven office in Connecticut and the Moline office in Illinois, respectively.

Mr. Hirsch will handle sales of Lincoln arc welding machines and electrodes in the state of Connecticut, and Mr. Lindgren's territory will include northwestern Illinois and central and eastern Iowa. Mr. Hirsch was formerly with the company's Pittsburgh district, and Mr. Lindgren was with the North Haven office.

J. W. Bloomquist, the new domestic-sales manager for Euclid Division, General Motors Corp., Cleveland, Ohio.

Euclid Names Bloomquist Domestic Sales Manager

The former Hibbing, Minn., manager of the sales and service branch of Euclid Division, General Motors Corp., Cleveland, Ohio, J. W. Bloomquist, has been made domestic sales manager of the company. He will have headquarters in Euclid's home office in Cleveland. Joining the company in 1945, Mr. Bloomquist was district sales representative and assistant manager of domestic sales before being assigned to Hibbing.

Taking Mr. Bloomquist's post in the Minnesota branch is R. M. Brown, former district sales representative in Ohio, Michigan, Kentucky, and western Pennsylvania. The territory formerly covered by Mr. Brown is being covered by J. E. Ehlert, who has served in both the sales and service departments of the organization since 1946.

Clark Sutherland Heads Clay Pipe Research Body

The vice president of the Robinson Clay Products Co., Akron, Ohio, Clark Sutherland, has been re-elected president of The National Clay Pipe Research Corp. The organization represents the vitrified clay pipe industry and is wholly engaged in research development for clay products.

Officers elected with Mr. Sutherland were Elmer Ligon, vice president; W. C. Boren, treasurer; and J. W. McClave, secretary. Elected as trustees were R. T. Antrim, E. C. Clemens, H. W. Jewell, and D. M. Strickland.

H. K. Porter Appoints New Assistant Treasurer

Robert C. Houser, formerly manager of the Pittsburgh office of Peat, Marwick, Mitchell & Co., has joined H. K. Porter Co., Inc., Somerville, Mass., as assistant treasurer.

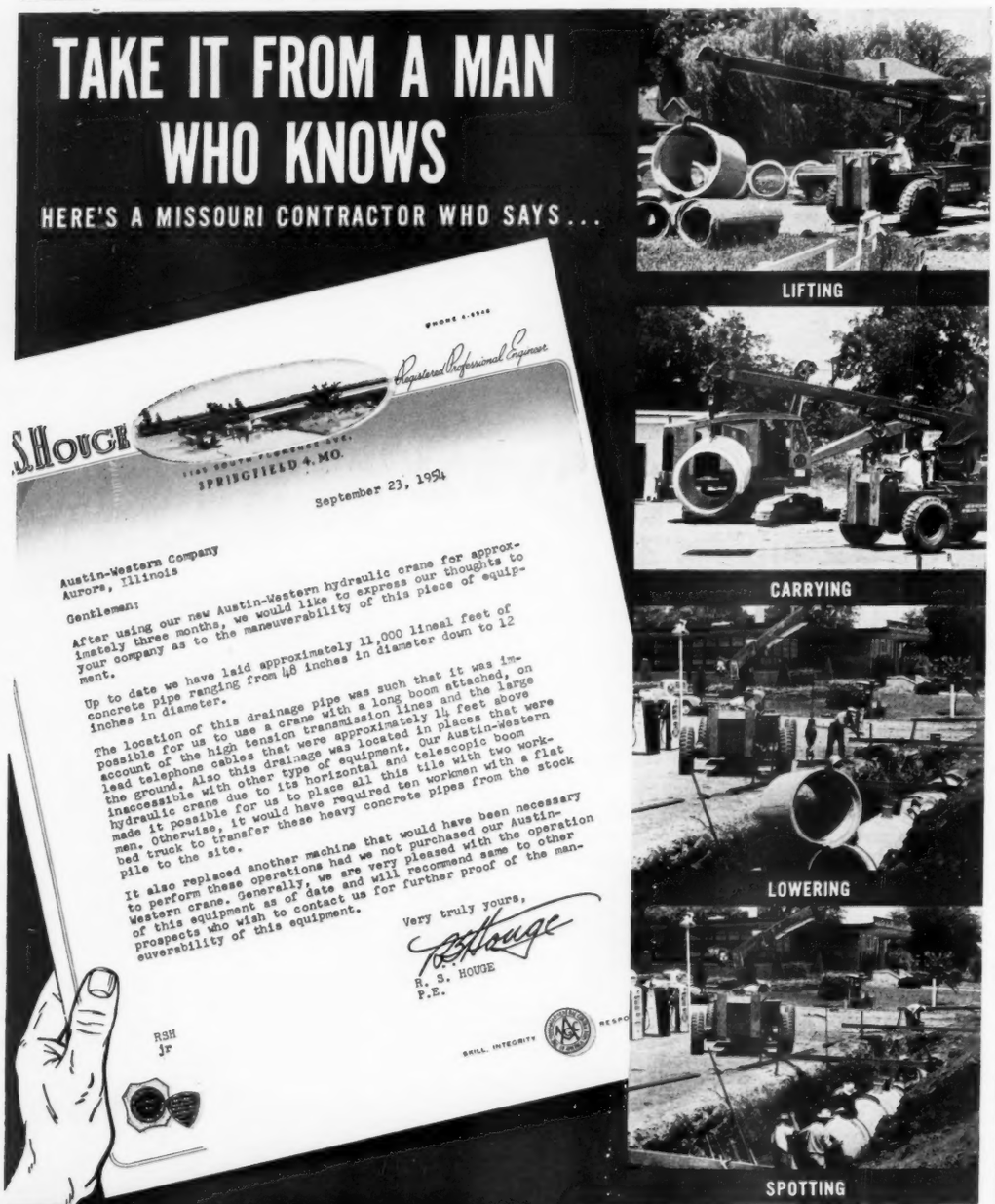
A graduate of Bucknell University, Mr. Houser is a Pennsylvania certified public accountant and a member of the American Institute of Accountants, the Pennsylvania Institute of Certified Public Accountants, and the Institute of Internal Auditors.

C.I.T. Appoints

Forest J. Paulson has been appointed by the C.I.T. Corp., New York, N. Y., a subsidiary of C.I.T. Financial Corp., to represent the firm in the 19 Washington counties east of the Cascade Mountains. He will be located in Spokane, Wash.

TAKE IT FROM A MAN WHO KNOWS

HERE'S A MISSOURI CONTRACTOR WHO SAYS...


R. S. HOUGE
Registered Professional Engineer
SPRINGFIELD 4, MO.
September 23, 1954
Austin-Western Company
Aurora, Illinois
Gentlemen:
After using our new Austin-Western hydraulic crane for approximately three months, we would like to express our thoughts to your company as to the maneuverability of this piece of equipment.
Up to date we have laid approximately 11,000 lineal feet of concrete pipe ranging from 48 inches in diameter down to 12 inches in diameter.
The location of this drainage pipe was such that it was impossible for us to use a crane with a long boom attached, on account of the high tension transmission lines and the large lead telephone cables that were approximately 14 feet above the ground. Also this drainage was located in places that were inaccessible with other type of equipment. Our Austin-Western hydraulic crane due to its horizontal and telescopic boom made it possible for us to place all this tile with two workmen. Otherwise, it would have required ten workmen with a flat bed truck to transfer these heavy concrete pipes from the stock pile to the site.
It also replaced another machine that would have been necessary to perform these operations had we not purchased our Austin-Western crane. Generally, we are very pleased with the operation of this equipment as of date and will recommend same to other prospects who wish to contact us for further proof of the maneuverability of this equipment.
Very truly yours,
R. S. HOUGE
P.E.
RSH
jr
SKILL. INTEGRITY
LIFTING
CARRYING
LOWERING
SPOTTING

AUSTIN-WESTERN COMPANY

Construction Equipment Division • Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

Power Graders • Motor Sweepers

Road Rollers • Hydraulic Cranes

AUSTIN-WESTERN COMPANY

629 Farnsworth Avenue, Aurora, Illinois

Please send complete information and literature on the Austin-Western Hydraulic Crane.

Name.....

Title.....

Company.....

Street.....

City..... Zone..... State.....

H. S. Clark Heads New LeTourneau Division

R. G. LeTourneau, Inc., in an effort to consolidate all of its steel mill operations, has formed a steel products division with offices at Longview, Texas, where the headquarters of the company are located. General manager of the new division is Harry S. Clark, the former Texas division manager.

The formation of the new division has brought about major changes in management assignments within the company. James M. Molpus, who succeeded Mr. Clark as Texas division manager, has been succeeded as general manager of the Mississippi division by Ben W. LeTourneau.

Rook Is New Manager For Blaw-Knox Division

With his appointment as vice president and general manager of the Blaw-Knox Equipment Division, E. C. Rook has assumed management of the company's largest fabricating unit. The main plant of the division is located at Blawnox, Pa., and a branch plant is located at Elyria, Ohio.

E. C. Rook, vice president and general manager of the Blaw-Knox Equipment Division.

Recently retired as a captain in the navy, Mr. Rook succeeds G. L. Dirks, who resigned his post with the construction-equipment firm.

American Tractor Corp. Creates Executive Post

A new executive position within the sales organization of American Tractor Corp., Fort Wayne, Ind., has been created to handle the rapid expansion of the company's sales volume.

The post, that of general sales manager, has been assumed by C. F. Rogers, who will work directly with the president and vice president of the company. Formerly general sales manager of Lindsay Bros., Inc., Milwaukee, Wis., equipment distributors, Rogers will effect local service to each trading area and give sales coverage for some 30 different markets.

Failing Promotes Two

The George E. Failing Co., Enid, Okla., manufacturer of portable drilling rigs, has promoted two members of the organization. Everett P. Carley has been named to the position of chief engineer, and E. L. Alexander has been made a director of the company.

Mr. Alexander will supervise the production and engineering departments.

Jack W. Weber, sales manager for Aeroil Products Co., Inc.

Aeroil Products News

The new sales manager for Aeroil Products Co., Inc., South Hackensack, N. J., is Jack M. Weber. Mr. Weber, in complete charge of national and export sales for Aeroil, will maintain headquarters at the South Hackensack office of the company.

Ridge Tool Appoints

Three new factory representatives for Ridgid pipe tools have been appointed by the Ridge Tool Co., Elyria, Ohio.

Handling the state of Illinois is Carl Petersen, exclusive representative in the state. The representative in Michigan, and Indiana is Milo Sharp.

The states of North Dakota, South Dakota, and Wisconsin, and the upper Michigan peninsula will be served by Walter R. Miller.

Timken Promotes Three

Three promotions in the sales department of the company have been announced by the Timken Roller Bearing Co., Canton, Ohio.

Matt Conley, sales engineer for the company, has been appointed district manager of the Steel and Tube Division, Milwaukee, Wis. Starting in Timken's metallurgical department in 1948, he was successively sales trainee, sales engineer in the Chicago office, sales expediter, and sales engineer in the Cleveland and Milwaukee offices.

John Szuhay has been assigned to the Cleveland office as sales engineer. He is a graduate of Case Institute of Technology. Bruce Wise, also a graduate of Case Institute, has been appointed to the company's Los Angeles office. Both recently completed the sales training program.

American Explosives and Accessories Clear the Way for America's Super-Highways!

Here's the Breakdown!

Highway	No. of Contractors	Time	Types of Rock	American Explosives Used
Pennsylvania Turnpike Irwin to Carlisle	5	1939	hard limestone, shale, limestone, trap rock, sand rock	40%, 60% ammonia and gelatin dynamites
Philadelphia Extension Turnpike	5	1949-50	"	"
Western Pennsylvania Extension Irwin to Ohio Line	3	1951	Same, except no trap rock	"
West Virginia Turnpike Charleston to Princeton	4	1953-54	shale and sandstone, hard, medium, soft	40% ammonia and gel, plus semi-gels
New York Thruway Buffalo to New York City	6	1953-54	hard to soft limestone, gneiss rock, trap rock, hard shale	40, 60, 75% standard gel and semi-gels
Ohio Turnpike Eastern border to Indiana Line	1	1953-54	shale and limestone	40% standard gel

Express highways like the famous Pennsylvania Turnpike and the New York Thruway are revolutionizing motor transportation and highway construction methods.

Today, construction engineers and contractors have to think in terms of state-wide roads, over every type of terrain – presenting a wide variety of construction problems. They have to make sure that the equipment they use – the tools, machinery and explosives – will do the job wherever it happens to be.

Leading contractors on major expressways, and quarry operators along the route who supply stone for the right of way, rely on American Explosives for safe, economical handling, good breakage, and dependable results with every shot.

Capable Field Engineers Are Available At Your Call

HIGH EXPLOSIVES • PERMISSIBLES • BLASTING POWDER • BLASTING ACCESSORIES

AMERICAN Cyanamid COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.
Sales Offices: Pittsburgh, Pa., Bluefield, W. Va., Scranton, Pa., Chicago, Ill., Pottsville, Pa., Maynard, Mass.

BLAW-KNOX

Bituminous Paver

APPROVED

The approval of the Blaw-Knox Bituminous Paver by the Highway Department of the Commonwealth of Pennsylvania should have real significance to contractors considering the purchase of new asphalt finishing equipment. The State of Pennsylvania is particular about how its roads are laid and the approval of the Blaw-Knox Paver came only after the laying and examination of many miles of road in the Pittsburgh area.

Contractors who plan to buy a new asphalt paver should give serious thought to the savings made possible by wheel operation. The Blaw-Knox Bituminous Paver gives *a better surface at higher speed.* Its mobility cuts relocation time and truck waiting time. Its more simple design *materially* reduces upkeep cost. Don't buy a Bituminous Paver until you have the whole story on the Blaw-Knox.

On wheels it will pave for less

BLAW-KNOX COMPANY
Foote Construction Equipment Div.
1916 State Street, Hunda, New York